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USSR Report

SCIENCE AND TECHNOLOGY POLICY

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18 February 1986

USSR REPORT
SCIENCE AND TECHNOLOGY POLICY

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Moscow EKONOMIKA I MATEMATICHESKIYE METODY in Russian Vol 21, No 5, May 85
pp 22-33

[Article by D. Palterovich: "Planning and Cost Accounting in the Management of Scientific and Technical Progress"; first paragraph is EKONOMIKA I MATEMATICHESKIYE METODY introduction]

[Text] The acceleration of scientific and technical progress requires the reform of the system of the planning and management of the entire economic mechanism. The means of such a reform were outlined by the April (1985) CPSU Central Committee Plenum. Among them an important role is being assigned to the increase of the efficiency of the centralized principle in management and planning, the increase of the economic independence of enterprises, and the active use of cost accounting and the entire arsenal of economic levers and stimuli. The specification of these means and methods is a necessary prerequisite of the acceleration of scientific and technical progress.

The acceleration of scientific and technical progress under the conditions of the measures on the improvement of the economic mechanism, which are being implemented, as well as are being planned, to a great extent depends on the role which the methods of centralized planning and cost accounting play in the management of this process. Here the direction, which was indicated by the April (1985) CPSU Central Committee Plenum on the reform of the entire economic mechanism: by developing further the centralized principle in the solution of strategic problems, to advance more boldly in the direction of the increase of the independence of enterprises, the strengthening of cost accounting, and the increase of the interest and responsibility of labor collectives, is most important.

The pursuit of a unified technical and structural policy should become the most important function of centralized planning in the area in question. At present the management of scientific and technical progress is being carried out primarily by the establishment for associations and enterprises of detailed assignments on the assimilation and introduction of new equipment and by the distribution of capital investments, assets of the unified fund for the development of science and technology, and funds for equipment and materials. Enterprises, not being sufficiently interested in new, especially fundamentally new, equipment, most often attempt to avoid the difficulties

connected with its assimilation. This causes a "response" of the system of centralized planning: the greater detailing of the assignments on new equipment, the increase of the number of indicators which are approved above, in particular, such ones as the amount of expenditures, the stage-by-stage deadlines, and the economic impact from each measure on new equipment. The assignments are frequently approved without adequate study of the question of the need for and possibility of their fulfillment, while in the reports the indicators of the plan are cited instead of the actual data.

Even under the conditions of the economic experiment being conducted on the broadening of the independence of enterprises and the increase of their responsibility for the results of their activity a shift from the decrease to the increase of the number of centrally planned assignments on new equipment has been noted. Thus, at the beginning of its conducting (1984) only the basic assignments of the scientific and technical programs on the development, assimilation, and introduction of new equipment and technological processes and on the scientific organization of labor were approved in the plans of the enterprises, while starting in 1986 the approval of all the assignments on the development, assimilation, introduction, and expansion of the use of new equipment is envisaged. In conformity with the decree of the CPSU Central Committee and the USSR Council of Ministers "On the Extensive Dissemination of New Methods of Management and the Increase of Their Influence on the Acceleration of Scientific and Technical Progress" starting in 1986 the assignments on the assimilation of new equipment will be included in the volume of sold products (with the same responsibility for the upsetting of the assignments as for the nonfulfillment of deliveries in accordance with contracts). This is leading to a significant increase of the role of directive planning. However, the enterprises will strive to avoid the inclusion in the plan of those assignments on new equipment, the fulfillment of which has been placed in doubt, since, for example, 1 insufficiently developed model deprives them of 15 percent of the addition to the material incentive fund. It is possible to overcome this only by means of additional cost accounting stimuli of the assimilation of new equipment.

From practical experience it is well known that the unified technical policy can far from always be implemented even if there is a large number of assignments and measures on new equipment. In industry during 1983 alone 795,000 such measures were implemented, the expenditures on them (including the expenditures of past years) came to 11.3 billion rubles. But here the planning organs, ministries, and departments, which are engaged in the drawing up of a large number of assignments, are solving far from completely the most important problems of the unified technical policy (we will characterize them below), which are not within the competence of the enterprises.

It is not enough to envisage in the plan the priority development of one advanced technical direction or another. It is also necessary to subordinate this development to the solution of socioeconomic problems and to lend it an effective structure. Let us take, for example, the development of robotics. The assets being allocated for this advanced direction for the most part are being used for the development of inefficient materials handling robots. The outlays for the robotization of one machine tool come to approximately 40,000-50,000 rubles, while the saving on wages in case of the introduction of

a materials handling robot does not exceed 4,000 rubles a year. At several enterprises a saving is totally absent. Meanwhile sufficient attention is not being devoted to the production of more efficient technological robots (for welding, cutting, soldering, painting, and so forth) and robots of the overhead type, which are designed for attending significant groups of machine tools. (Footnote 1) (See L. Volchkevich, "Robots Today and Tomorrow" (IZVESTIYA, 2 June 1985)) In developing the first flexible machine systems the basic attention is also being devoted to the automation of the movements of parts and the tool, and not to the introduction of fundamentally new technological systems and methods of machining.

Thus, the assignments (goal programs) on the development, production, and introduction of robotic complexes and flexible machine systems are being approved and reported to each performer from the center. However, the basic problems of scientific and technical policy in this area, just as in a number of other areas of technology, are not always solved satisfactorily. Apparently, it is advisable to change the functions of the organs of centralized management, shifting the center of gravity in their activity from operational tasks to strategic and structural problems of the development of technology. The attempts to regulate in detail from above a large number of technical measures frequently complicate the realization of the strategic directions of scientific and technical progress.

The lack of the necessary coordination between planning organs and the performers of the assignments on new equipment is affecting the progress of the formulation and implementation of the Comprehensive Program of Scientific and Technical Progress and scientific and technical goal programs, which are an important means of pursuing the unified technical policy. In the Comprehensive Program of Scientific and Technical Progress the sections, which are devoted to a retrospective analysis and the analysis of the present situation, often are more specific and substantiated than those in which a forecast for the period of effect of the program is given. In the latter the data on the time and conditions of the realization of new directions of technical development, their effectiveness, the necessary resources, and the scale and mechanism of introduction frequently are absent or are not confirmed by calculations. The gap between the content of the Comprehensive Program of Scientific and Technical Progress and the specific assignments, which are envisaged in the five-year and annual plans, often is also explained by this.

Technical policy finds reflection in the structural and investment policy, which ensures the priority development of the most effective types of equipment, materials, and technological processes, which conform to the specific needs and conditions of their use. However, in the production structure and in the structure of the output being produced progressive changes are not always carried out intensively. Thus, in ferrous metallurgy over the past few five-year plans significant capital investments have been channeled into the simple and expanded reproduction of obsolete units and technologies. In machine building much equipment, which is becoming obsolete, is still being produced, while for the production of advanced or very scarce equipment at times there are not enough production capacities.

The attempts to pursue technical policy by the approval for associations and enterprises (at times contrary to their economic interests and possibilities) of a large number of assignments on new equipment or by the allocation of the latest expensive equipment through centralized capital investments also entail other undesirable consequences: the fulfillment of the assignments on the assimilation of new types of products at times is dragged out for many years, the fundamentally new equipment being received (computers, machining centers, industrial robots, and so forth) takes a long time to be assimilated or is used inefficiently. Experience shows that, when purchasing equipment at their own expense, enterprises display greater concern for the economic substantiation and for the quickest placement into operation and preparation of the conditions for the efficient use of expensive equipment. The use of highly productive machine tools, computers, and robotics, which at times is unsatisfactory, attests that the "forceable" introduction of new equipment in an insufficiently prepared environment or the purchase of such equipment for the sake of prestige at the expense of the state, that is, as if free of charge for the enterprise, frequently leads to a "splitting reaction" and does economic harm to the national economy.

What should the relationship of centralized planning and cost accounting methods in the management of scientific and technical process be in order to ensure, on the one hand, its acceleration on the basis of the independence and responsibility of enterprises and, on the other, the priority of the most advanced directions, which meet the long-range national economic interests? In other words, which functions should belong to the organs of centralized planning and which problems can associations and enterprises solve independently on the basis of the development of cost accounting relations? The posed questions are the most important ones in the entire set of problems of the reform of the mechanism of the management of the economy, since the system of the planning and stimulation of scientific and technical progress should be developed as a component of the entire economic mechanism. The functions of the organs of centralized management should be implemented so that the initiative of sectors, associations, and enterprises would not be paralyzed, but at the same time the solution of the strategic problems, among which it is possible to single out the following ones, would be ensured.

The choice of the main, most advanced directions of scientific and technical development of sectorial and intersectorial importance, as well as the organization of their large-scale introduction by the formation of specialized sectors and subsectors, the establishment of new enterprises and large works for the development of the latest types of equipment by the allocation of centralized capital investments, scarce resources, and so forth first of all should be ensured on the basis of centralized management. Here it is necessary to identify the priorities of the indicated directions and to determine on this basis the needs for and the structure of the most important types of new equipment for each sphere of its use. These tasks of centralized planning are acquiring particular importance under the conditions of the new stage of the scientific and technical revolution, when significant assets and such structural changes, which can be accomplished only at the national economic level, are required for the development of flexible automation, the introduction of electronics and biotechnology, the development of new types of

power and transportation equipment and other fundamentally new equipment technology.

Further, the organization of the development of sectorial and functional systems of machines and their transformation into the basis of the planning of both the development and production of new equipment and the retooling of the sectors which are the users of the equipment are necessary. The USSR State Planning Committee and the USSR State Committee for Science and Technology could already now approve a list of such systems and their developers.

The next stage of centralized management is the provision of the organizational and economic conditions, which facilitate for associations and enterprises the processes of the development, the assimilation of the production, the introduction, and the use of equipment and technology, which conform to the highest world level. The organs of centralized planning carry out the formulation of the set of economic standards which stimulate scientific and technical progress: the standards of the distribution of the profit, the formation of economic stimulation funds and the unified fund for the development of science and technology, as well as several indicators of the replacement of fixed capital or the technical level of production and products (for example, technological equipment, the decrease of the materials intensiveness or the specific expenditures per unit of capacity).

One should also group with the strategic tasks the implementation of measures on the concentration and specialization of production, the development of pilot experimental works, and the creation of the other organizational prerequisites for the rapid introduction and intensive use of the latest equipment, as well as the assurance of a high level of the standardization and unification of various components of new equipment, including control systems and programs for NC equipment.

For the elimination, for example, of the mentioned gap between the Comprehensive Program of Scientific and Technical Progress and its reflection in the implementation of the plans of socioeconomic development not only academic and sectorial institutes, but also the performing ministries and, in a number of cases, leading production and scientific production associations should take part in the formulation of this program. This will create certain prerequisites for the mandatory transfer of the assignments of the Comprehensive Program of Scientific and Technical Progress to the plans of socioeconomic development. The direct cooperation of the performers with scientists in the process of the formulation of the named program will make it possible to specify more soundly in it the priorities of the directions of technical progress, as well as the time and conditions of their realization. It is necessary, in our opinion, to increase substantially the role and to change the procedure of the formulation and fulfillment of scientific and technical goal programs, which for the present still differ little from coordinating plans, since there are no authorized organs which are responsible for the supervision and financing of their implementation. It is advisable to give to such organs the functions of the general client who has been given extensive rights and financial assets for the fulfillment of the program. The USSR State Committee for Science and Technology, its institutes, or other organizations on the instructions of the State Committee for Science and

Technology could perform the functions of the general client for intersectorial programs, while the corresponding ministries and departments, republic and local planning organs could perform them for sectorial and regional programs.

The relations of the general client with the enterprises and organizations, which are the performers of the work on the program, should be organized on a contractual basis. This will make it possible (without violating the rights of the organizations and enterprises) to establish in the contracts the real deadlines and conditions of the fulfillment of the work on the programs, as well as the procedure of financing. Payment should be effected by the general client after the acceptance of completed major independent operations. Since a significant portion of the centralized and other capital investments will be allocated for the implementation of scientific and technical comprehensive goal programs, they can become a powerful means of the orientation of scientific and technical policy toward the solution of major national economic problems which are connected with the development of fundamentally new and promising types of equipment and technology.

The construction of new enterprises (or the establishment at operating enterprises of new large works), which should also be envisaged in the corresponding programs (plans) and be financed by means of centralized capital investments, is required for their development. As for the problems of the modernization of equipment, the retooling of production, as well as other problems which are not covered by the programs, associations and enterprises can solve them independently, using their own assets or the assets of clients. The manufacturing production associations should play a more and more active role in the determination of the need for specific items on the basis of direct contacts with the users. The need for the development of advanced technical directions, for the creation for this of new production capacities, and for the concentration of the forces of the scientific, planning, and design potential is established centrally.

At the beginning of the conducting of the large-scale economic experiment its most important basic principles, in our opinion, were not observed--the unity of all the aspects of the system of management and the comprehensive nature of its change. A serious contradiction, apparently, consists in the fact that, having broadened the rights of associations (enterprises) in the determination of the number of plan indicators and having increased the stimuli of their fulfillment, the experiment did not touch upon the sphere of the formation of the nomenclatural plan and the file of orders for products, including new equipment. The questions of wholesale trade in means of production and the establishment of direct economic relations are not being settled effectively, the monopoly of the supplier of means of production has not yet been eliminated, and the client has not received if only the limited opportunity to choose a supplier. Thus, the foundations of the competitiveness and economic interest of enterprises in the choice of the most effective technical plans and solutions, in the determination of the optimum economic relations, and in the conclusion of contracts with suppliers, who ensure the high quality of the materials and components being supplied, the timeliness of their deliveries, and the decrease of the cost, were not created under the conditions of the experiment.

For the purpose of the significant strengthening of the prerequisites for the development of economic initiative and socialist enterprise it is advisable to develop, check experimentally, and disseminate new forms of the unlimited distribution of means of production, which is carried out on the basis of direct ties. Obviously, it is necessary to introduce these forms gradually, starting with those types of products, which are not scarce and are not of strategic importance. The lists of centrally allocated types of products should be systematically reduced. As the first step enterprises should already now be granted the right to sell at their own discretion products produced in excess of the plan, as well as those means of production, which are not scarce. Here, apparently, at associations and enterprises it will be necessary to set up special services for the study of the demand and the formation of a long-range file of orders for the products being produced by them, including an analysis of the need for the assimilation of new items (of course, within their products list). Such services will contribute to the more complete utilization of production capacities and the increase of the competitive ability of products on both the domestic and foreign market.

Sectorial and functional systems of machines, (Footnote 2) (On the role and principles of the formation of such systems see D.M. Palterovich, "Planirovaniye tekhnicheskogo perevooruzheniya proizvodstva" [The Planning of the Retooling of Production], Izdatelstvo "Ekonomika", 1982, pp 104-131) which encompass either all the basic and auxiliary processes of each sector (sectorial systems) or all the versions of the equipment of a specific functional purpose (for example, materials handling equipment, motors, instruments), and not individual lines and complexes, should become the main means and basis of the centralized management of the development of equipment. The systems of machines should be developed by the sectors of machine building jointly with the consuming sectors, should be intended for a future period of 10-15 years, and should be adjusted every five-year plan.

The failure to include in the statewide plans a substantial portion of the measures on new equipment does not rule out at all the active influence of the organs of centralized management on the nature, structure, and time of their implementation, and so on. Both the direct and the indirect methods of such influence can be extremely diverse. A significant portion of the measures, which are implemented independently by associations and enterprises, will be connected to one degree or another with the program assignments which are established in a centralized manner. But the organs of centralized management, ministries, and departments should exert the main influence on the pursuit of the long-range technical policy by the creation of the organizational, economic, and financial conditions for the development of advanced types of equipment and technology and the retooling of production.

The greatest difficulties in the area of retooling and the assimilation of the production of new equipment are connected most often with the lack not of monetary assets, but of high-quality designs, equipment, skilled specialists, and technical assistance in the introduction, assimilation, hardware and software supply, service, and repair of new equipment. The centralized organs first of all should promote the drafting and selection of the most advanced plans of new equipment and retooling, should ensure the possibility of the allocation of limits for planning, construction, and installation operations

and equipment, should organize technical assistance and the training of personnel, and should establish sectorial and intersectorial technological centers--engineering production firms. The latter in accordance with contracts with enterprises would carry out the entire set of operations from the determination of the need for the latest equipment to its production, the making up of sets, start-up and adjustment operations, technological and software supply, and, if necessary, also service and repair, as, for example, the Energotekhprom Pilot Production Engineering Enterprise or the Ivanovo Machine Tool Building Association imeni 50-letiya SSSR is doing. For the present there are few such firms. In a number of cases due to the impossibility of obtaining assistance in introduction enterprises refuse advanced equipment or purchase it in negligible quantities, in case of which its use does not yield an impact.

Sectorial institutes of scientific and technical information can also play a considerable role in the system of scientific and technical services. Their functions for the present are confined, as a rule, to the issuing of reports or the publication of technical and technological data. It is advisable to establish at them groups of consultants, who, for example, not only would issue reports on the available equipment and technology, but on the basis of the survey of enterprises would give conclusions on what advanced equipment and technology can be used most effectively there. The system of scientific and technical services, which has been organized on the basis of decisions of organs of centralized management, should operate on a cost accounting basis.

The cost accounting system of the development and introduction of new equipment, which has formed in recent years in industry, includes such levers and stimuli as the cost accounting of the primary units--associations, enterprises, scientific research and planning and design organizations, the carrying out of all the stages of the development of new equipment in accordance with unified supply orders, the financing of the bulk of these operations at enterprises from the assets of the unified fund for the development of science and technology, stimulation from specialized funds, which are formed by means of a part of the impact from the introduction and use of new equipment, and a system of markups and discounts. As for the technical updating and retooling of production, here the cost accounting relations should be based on the use of the enterprises' own assets or bank credits, on the mandatory substantiation of the effectiveness of expenditures, and on the conclusion of contracts for the delivery of equipment, construction and installation operations, and technical assistance.

However, in practice cost accounting in the indicated areas has not undergone adequate development, and at times is of a formal nature. The supply orders, to which it was intended to give the force of economic contracts, reflect more administrative relations than cost accounting relations. Primarily one's own ministry, and not the consumer, whose cost accounting levers of influence on the developers of new equipment are very weak, carries out the financing and the monitoring of the fulfillment of the assignments. To a certain degree the consumer can use his participation in the acceptance of models of new equipment and in the coordination of the price for it.

The task is to shift from the demarcation of the functions of centralized planning and cost accounting in the management of scientific and technical progress to their integration. For this it is necessary, at least, that the sectorial or statewide planning organ, when issuing assignments for the development and production of some equipment or other, along with national economic interests would take into account their reflection in the specific impact of the developer, supplier, and consumer. It is possible to cite many examples, when the potentials of new equipment are not fully realized only because the enterprises, organizations, or departments are not interested in this. Thus, automated systems of accounting and control frequently encounter opposition, since they prevent the managers of enterprises, organizations, or their subdivisions from drawing up the report at their own discretion. Because of this the work of the computer centers of enterprises and sectors is complicated, and at times is even depreciated, the introduction of new instruments is delayed. At one of the institutes of the Ministry of the Electrical Equipment Industry with the sanction of the ministry they halted the work on the development of very efficient instruments for the complete continuous nondestructive checking of the magnetic properties of electrical sheet steels, but destroyed models of the instruments together with accessories and the technical specifications with a total value of 400,000 rubles. Complete tool checking proved to be unprofitable not only for the producer, but also for the user of the steel, since it prevents in case of a shortage the use of substandard material.

Obviously, the sanctions for the delivery of items made of low-quality materials should be significant, in order to force the supplier to carry out the complete checking of materials and components. The expenditures on complete checking should be included in the cost of items with a sufficiently high profit, which will be a cost accounting stimulus of the introduction of advanced methods of checking.

In the area of the financing of operations on the assimilation of new equipment the effect of cost accounting levers is confined primarily to compensation for the increased expenditures of the period of assimilation. However, the granting to enterprises of the assets necessary for this from the unified fund for the development of science and technology far from always proves to be an adequate stimulus of the surmounting of the difficulties connected with the introduction of new equipment. So that enterprises would actually "pursue" technical innovations, it is necessary to create such conditions, under which without these innovations they will not be able at all to ensure even the minimum required level of profitability. This, obviously, is possible if the client receives the right to choose a supplier, while the sale of obsolete products is not guaranteed the latter.

The shortage of many means of production is usually considered the basic obstacle to the choice of a supplier. However, in itself the shortage is relative and frequently exists in case of excessive stocks of similar products at other enterprises or in case of their wasteful use. Such steps as the abolition of central allocation, the improvement of the analysis and accounting of the need and the system of the distribution and redistribution of means of production, the significant strengthening of the cost accounting stimuli of the saving of means and objects of labor, and others will

contribute to the elimination of the shortage. This will also make it possible to shift from the monopoly of the producer to the decisive influence of the consumer on the structure and quality of products, first of all new equipment.

The effect of cost accounting methods is also limited in the sphere of the stimulation of the developers of new equipment of both organizations and the immediate performers of research and development, the authors of inventions and efficiency proposals. The cost of the results of technical developments, which have been performed by scientific research institutes and design bureaus, is formed on the basis of the expenditures, and not the economic impact from their use. The transfer of technical innovations, which have been developed at one enterprise, to other enterprises of one's own ministry is carried out free of charge. Registered inventions and efficiency proposals can be used by any organization or enterprise without consultation with their authors.

The limitation of the sphere of effect of cost accounting levers in many ways is connected, so it seems to us, with theoretical conceptions which deny the commercial qualities of the results of applied research and development. Without going into a discussion of the theoretical aspects of this problem, let us note that only on the basis of the recognition of the commercial nature of relations in the sphere of the development and circulation (exchange) of detail designs and decisions is it possible in practice to ensure the genuine interest of organizations and enterprises in the quickest development, assimilation, and introduction of new equipment. Of course, all the restrictions of commodity relations, which are characteristic of the socialist economic system, should also be extended to such a special commodity as are the results of technical developments. At the same time the prices for designs and other results of developments should be formed with allowance made for not only the expenditures on the developments, but also the real impact which is obtainable by the user from them. The profit, which is formed as the difference between the price and the expenditures, will be the cost accounting impact of the scientific research institutes, design bureaus, scientific production associations, and enterprises which develop new equipment.

During the planned reform of the economic mechanism it is advisable to broaden significantly the sphere of use of cost accounting relations and stimuli of scientific and technical progress and to enhance their role. First of all one should introduce more boldly the cost accounting responsibility of the clients of new equipment and the superior levels of management, as well as the organs of material and technical supply and other organizations, which should compensate the enterprises for the harm which is done to them by improper orders or other actions, which lead to the upsetting of the fulfillment of the assignments, to the production of equipment which is not in demand, and so forth. The instances, when a production or scientific production association on the instructions of its ministry begins the development of a new power, metallurgical, or other unit, purchases for this expensive materials and components, carries out design development, and produces individual parts and assemblies, but then the delivery of the unit is eliminated from the plan or postponed to a later date, are now frequent. Obviously, such orders should be registered in advance by contracts, which envisage the responsibility of both

the producer and the client, regardless of whether an enterprise or an organ of management is it.

It is important to implement consistently the principle of the self-financing of measures on the updating of the production system, the renovation and retooling of operating production. For this it is necessary to provide every association (enterprise) with sufficient funds for production development and new equipment, moreover, these funds should not be "made a gift" to enterprises, but should be earned by them. Obviously, such measures as the transfer to enterprises (in accordance with the norms) of not less than half of the assets of the unified fund for the development of science and technology, the transfer to the development fund of 50-100 percent of the amortization deductions for renovation, all the deductions for capital repair, and a substantial portion of the profit, (Footnote 3) (In conformity with the decree on the extensive dissemination of new methods of management the differentiation of the standards of the deductions for the production development fund (which are stable for the 5-year period) is made subject to the level of the use of fixed production capital and the results of the economic operations of the associations (enterprises). In our opinion, when formulating the indicated standards one should also take into account the age structure of the stock of equipment and the rate of technical progress in this area) the combining of the unified fund for the development of science and technology and the development fund into a single fund, along with the more extensive use of credit, will provide enterprises with the opportunity to finance the majority of scientific and technical measures by means of their own assets. Moreover, they will be able to decide independently for what purposes to spend them, to choose between the replacement of equipment, capital repair, modernization, and so forth.

Of course, subsidies from centralized sources of financing may be needed for the assimilation or introduction of the most expensive types of latest equipment, for example, flexible computer-aided machine systems. They should be made available for a specific time (until the given type of equipment achieves a certain maturity). But for the most part such assets will be needed for the fulfillment of the program assignments which reflect the goals of the long-term scientific and technical policy.

The network of cost accounting enterprises and organizations, which carry out or contribute to the introduction of new equipment and ensure in necessary cases its service, technological and software support, repair and modernization, the production of nonstandard means of mechanization, the leasing of equipment and instruments, consultative assistance, and so forth, should hold a special place in the accomplishment of the tasks of the acceleration of scientific and technical progress and the increase of its efficiency. The more developed the network of listed organizations is, the more effective the system of the social division of labor, which is based on the functional specialization and cost accounting forms of cooperation of enterprises and organizations, which ensure the technical updating of production and products, will prove to be.

Cost accounting relations should undergo further development in the area of the use of inventions and efficiency proposals and their transfer from some

organizations and enterprises to others. Here, in our opinion, the changeover to a patent system could play a large role. Under our conditions the system of patents, which attaches to the individuals or organizations, to whom they have been issued, the exclusive right to use the inventions, cannot operate in the same way as in case of the private ownership of the means of production. In the socialist economy the possession of a patent or the transfer of a license for the use of inventions should not be used to the detriment of public or state interests. However, the necessary restrictions of the rights of patent holders will not interfere with the sharp increase of the interest of the authors of technical innovations in their rapid introduction and dissemination.

The changeover to a compensatory procedure of the transfer of technical innovations, which have been developed at one enterprise, to other enterprises should yield a similar result. The possibility of selling their technical innovations for a fee (having channeled the obtained amounts into the unified fund for the development of science and technology and in part into the payment of bonuses to the developers) will force enterprises to promote more actively the extensive dissemination of their technical or technological achievements. Here the prices of detail designs and solutions should (by analogy with the prices for means of labor) be determined with an allowance made for both the expenditures on their development and a portion of the impact from use.

The extensive use of the competitive system of the selection of detail designs and solutions should become a fundamentally new direction of the development of cost accounting relations in the sphere of the development and assimilation of new equipment. It is well known that one of the most important features of any task of a technical (as well as, incidentally, an organizational and economic) nature is the multiplicity of versions. In case of the designing of enterprises, as well as new machines and equipment competitions are announced in exceptional cases, although, according to the estimate of specialists, in case of the development on a competitive basis of just half of the standard designs of enterprises, buildings, and structures (for which not more than 7 million rubles will be needed) it is possible to obtain an economic impact of not less than 500 million rubles. (Footnote 4) (See V.M. Didkovskiy, "Designing on a Competitive Basis" (EKONOMIKA STROITELSTVA, No 10, 1980, pp 53-55))

Back in the 1960's measures on the development of extensive competition in the scientific and technical field and the prevention here of the monopoly of individual organizations were envisaged by the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Increase of the Efficiency of the Work of Scientific Organizations and the Acceleration of the Use in the National Economy of the Achievements of Science and Technology" (1968). For this purpose it was recommended to ministries and departments, academic and other scientific organizations in necessary instances to assign the performance of basic research, as well as planning, design, and technological development to several organizations which are working in different directions. The possibility of choosing the best scientific, technical, and economic solutions already at the early stages of development and, in case of the fulfillment of this specially important task, the need to

bring them up to the stage of the production of prototypes were also envisaged.

The importance of the organization of designing on a competitive basis was also emphasized in other decrees of executive organs. However, this was not backed by such steps as the allocation of the assets necessary for competitive designs, their inclusion in the plans of planning organizations, and the prohibition of the approval of designs which were developed without the organization of competitions.

It seems that not only technical, but also several structural economic alternatives, for example, such ones as the choice between the expansion and retooling of an enterprise and the choice of the objects of renovation or new types of products which are liable to assimilation first of all, can gradually become objects of competitions. The forms of the holding of competitions here, of course, are diverse. It is important, however, that the settlement of questions of this sort would be carried out after sufficiently extensive and objective discussion by both the interested parties and disinterested specialists.

It is advisable, in our opinion, to approve a special statute, having envisaged in it a broad group of designs, for which the declaration of competitions is mandatory, and the procedure of their holding and the evaluation of the results. The competitions, as a rule, should be open, an extradepartmental expert commission will summarize their results. Given the meeting of these conditions, as well as the allocation of the necessary assets for parallel developments and incentive bonuses it will be possible to overcome the monopoly of the main institutes and to intensify the creative competition of scientists, designers, and process engineers. As to additional assets for scientific research and experimental design development, in many cases they will not be necessary, since in practice various organizations on their own initiative frequently develop various designs, and only a mechanism of mandatory and objective selection is needed here. If additional assets for variant designing are needed, they will pay for themselves many times over by means of the overall increase of the quality of developments, the choice of the most effective designs, and the use in them of the best components of other designs. It will be possible to shift from competitions of developers and designers to the holding in specific cases of competitions of manufacturing enterprises: those enterprises, which will ensure a shorter time and better condition of the assimilation of the production of new efficient (and profitable without fail for the performer) equipment, will be able to receive orders for its production.

The proposed set of measures undoubtedly will increase the influence of consumers on the rate of technical progress and the level and quality of products. The possibilities of the choice by consumers of the best products, M.S. Gorbachev noted in this connection at the June conference in the CPSU Central Committee, could be broadened by the organization of competitions among manufacturing enterprises, the development of wholesale trade as resources are accumulated, and the increase of the role of direct relations and economic contracts.

Thus, the determination of the strategy of technical development and the creation of the economic mechanism and the structural, resource, and organizational conditions, which ensure the implementation of this strategy, are functions of centralized management, first of all its highest organs (the USSR State Planning Committee, the USSR State Committee for Construction Affairs, the USSR State Committee for Science and Technology), the role of which should be enhanced significantly on the basis of the increase of the scientific soundness of the plans, decisions, and directives which are being adopted. The practical implementation of the adopted strategy is a function of the primary units of economic management, associations and enterprises, which operate under the conditions of cost accounting and ensure the collective and individual interest of workers in the development, introduction, and use of new equipment. The interference of intermediate levels of management in the day-to-day activity on the pursuit of technical policy should either be eliminated or be carried out by economic, and not administrative, methods. Economic, cost accounting levers should be used extensively in the interrelations of enterprises with supply, transportation, and other infrastructural units, as well as local economic organs.

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ORGANIZATION, PLANNING AND COORDINATION

DEVELOPMENT OF REPUBLIC ORGANIZATIONS FOR INTRODUCTION

Kishinev SOVETSKAYA MOLDAVIYA in Russian 19 Sep 85 p 2

[Article by Candidate of Economic Sciences A. Bodyul, senior scientific associate of the Moldavian Scientific Research Institute of Scientific and Technical Information and Technical and Economic Research, under the rubric "Scientific and Technical Progress: Practice, Problems": "The Introducing Organization"; first two paragraphs are SOVETSKAYA MOLDAVIYA introduction]

[Text] The fact is well known: the time of the introduction of scientific and technical developments for the present is inordinately long. At times a technical innovation is not introduced because a powerful scientific research institute, which is working on this problem, is "competing" with it, sometimes the lack of conformity of the types of work of institutes and enterprises comes into conflict. In short, there are many reasons here. As a result the scientific potential is being used far from completely. Here is just one example. During the first 3 years of the current five-year plan the coperforming institutions of comprehensive scientific and technical programs received 375 certificates of authorship for inventions. In practice only...50 were used.

That is why, as was emphasized at the June conference in the CPSU Central Committee on questions of the acceleration of scientific and technical progress, it is necessary to improve in every possible way the organizational and economic forms of the integration of science, technology, and production.

One of these forms, which has completely justified itself, is the scientific production association. The activity of the Mikroprovod Scientific Production Association, the Volna Production Association, and a number of associations of the agrarian type convincingly attests that under the conditions of the scientific production association the time of the introduction of innovations is shortened significantly and the available scientific and technical potential is used more completely.

But what is one to do with the numerous enterprises which do not belong to associations? What is one to do with the inventions of individual authors, with the introduction of which in practice no one is concerned? What is one to do, finally, with the problem of the "copying" of innovations and the use

on an extensive scale of already tested scientific and technical developments? Introducing organizations have been established in a number of republics for the solution of these problems. In Azerbaijan there is a production center, in Latvia and Estonia there are the Orient and Effekt introducing firms.

The basic task of these organizations is the providing of assistance to inventors, efficiency experts, and scientific organizations (mainly those which do not have design bureaus and pilot works) in the development of the technical specifications and prototypes of machines, metal components, and means of mechanization, which ensure great efficiency in production.

Ministries, departments, higher educational institutions, scientific research institutes, design bureaus, the Republic Council of the All-Union Society of Inventors and Efficiency Experts, enterprises, and organizations, which submit to the performer the detail designs, sketches, descriptions, and other documents, which are necessary for the drawing up of the technical specifications, as well as materials and components, are the clients of the technical specifications and prototypes. The interrelations between the introducing organization and the clients are organized on a contractual basis. The economic contracts, which are concluded between enterprises and organizations, envisage the development, production, installation, adjustment, and testing of the innovation, as well as the designer's supervision of introduction at the enterprise of the client.

The thematic plan is formulated in a distinctive manner. The firm sends letters with the offering of its services to ministries, departments, organizations, and enterprises. The bottlenecks, the "undoing" of which the enterprises need first of all, but are not able to accomplish the problem on their own, are identified in the sectors and at enterprises and organizations.

Several introducing organizations, moreover, for the purposes promoting the achievements of scientific and technical progress organize and hold exhibitions of scientific developments, models of technologies and equipment, inventions, and efficiency proposals. They organize schools of advanced know-how for the study and promotion of the know-how of innovators and advanced methods of labor at enterprises.

What is the structure of such organizations? In the Orient Firm, for example, there are 22 designers and about 30 highly skilled all-round workers. The firm uses in practice the enlistment with the rights of the combining of jobs of temporary worker-specialists for the performance of one-time operations.

The Effekt Firm has its own design bureau and workshop. Here they work mainly on the introduction of inventions in production. An enterprise, which wishes to use an innovation, can order this work from the firm on an economic contractual basis. Orders are received from kolkhozes, plants, higher educational institutions, production associations, and scientific research institutes. The firms also introduce their own inventions.

What does the activity of such firms yield? First of all, and this is the most important thing, the time of the introduction of innovations is shortened, the accumulated scientific and technical potential is used more

completely. Moreover, scientists of academic institutes and higher educational institutions through the mediation of introducing firms in a systematic manner give practical assistance to enterprises and organizations. In Estonia, for example, scientists of the polytechnical institute and the institute for the improvement of the skills of management personnel provide consultative assistance on questions of the organization of management, the analysis of complex situations, problems, and so on.

In short, the advisability of special introducing organizations today does not raise doubts. Thus, perhaps, by borrowing the available experience, should an attempt also be made to establish such a system here? Especially as in general we have experience in organizing work of this sort.

It is correctly said that a new thing is an old thing which has been well forgotten. During the first half of the 1960's an intersectorial organization for the designing of new equipment and a pilot experimental base operated in the republic. These were the planning and design technological institute (PKTI) and the experimental machinery plant (EMZ), which now belong to the Ministry of Local Industry. The former developed the design and technical specifications for innovations for all the sectors of industry of the republic, using inventions, advanced know-how, and the recommendations of basic science, while the experimental plant implemented these designs, performed experimental operations, and jointly with the designers carried out the operational development of new equipment. Representatives of the planning and design technological institute and the experimental machinery plant took part in the start-up and adjustment operations directly at enterprises and promptly solved arising problems. A large number of machines and automatic machines, which were unique for that time, were developed during those years by the joint efforts of designers and experimenters.

These two organizations played in their day approximately the same role which the introducing organizations are playing today in several republics and oblasts, true, on a lower organizational basis.

But if we talk about the establishment of an introducing organization, first of all it is necessary to solve the problem of material and technical supply. The point is that this is one of the main issues which hinders the introduction in production of the achievements of science at the stages which follow the completion of research. For new construction materials, component assemblies, and parts are required for the development of a new item. The orders for material and technical supply are drawn up in accordance with the available items--analogues, therefore, significant deviations from the real needs might be allowed. This complicates extremely the process of the development of mockups and prototypes of items and lengthens significantly the period of introduction.

In this connection the need is arising for the establishment of a specialized base of the supply of scientific, design, introducing, and pilot organizations with a wide range and the necessary quantity of materials and components, which is a part of a specialized union administration of the USSR Main Supply Administration.

For the establishment of an introducing organization in the republic it is also necessary to solve a number of other problems. First of all it is necessary to study thoroughly the experience of the work of the introducing organizations, which are operating in the country, and, without copying it, to take from it all the best things which correspond to the specific nature of the republic. It is important to clarify the subordination of the new organization. In our opinion, it should be contained in the Council of Ministers. All this, as they say, is details. Today it is important to find one's position in the main thing--how to shorten the time of the introduction of innovations. Introducing organizations, of which it is a question, in our opinion, are capable of making an important contribution to the solution of this problem.

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FACILITIES AND MANPOWER

SCIENTIFIC, TECHNICAL CENTER FOR MAGNETOHYDRODYNAMICS

Moscow IZVESTIYA in Russian 11 Nov 85 p 2

[Article by IZVESTIYA science observer B. Konovalov: "An Alliance by Design. The Interdepartmental Scientific and Technical Center of the USSR Academy of Sciences and the USSR Ministry of Power and Electrification Has Been Established"]

[Text] Toward a New Power Engineering

First about the importance of the problem. The backbone of current power engineering is thermal electric power plants. Alas, in spite of the long history of development, the efficiency of the best of them does not exceed 40 percent. Hence, nearly two-thirds of the fuel, which is being extracted with enormous difficulty from the depths of the earth, are being used to no purpose. It is impossible to tolerate this. And science has outlined a means of the cardinal increase of the efficiency of thermal electric power plants--the use of so-called magnetohydrodynamic generators, which will make it possible to increase the efficiency to 50-60 percent.

At present on the average 326 grams of fuel are consumed in our country for each kilowatt-hour of electric power, which has been delivered to the network. The saving for the country of just one of these grams given today's scale of the generation of electric power would supply with fuel for an entire year such a large plant as the Konakovskaya GRES. While the calculations of scientists show that at future series-produced industrial MHD (magnetohydrodynamic) electric power plants only 252 grams of fuel will be consumed per kilowatt-hour of released electric power! It is easy to calculate what an enormous saving of fuel the new scientific and technical direction promises. Therefore, at present, when the country is actively changing over to energy-saving technologies, MHD electric power plants are becoming a star of the first magnitude in the power engineering sky.

In order to understand the principle of the MHD generator, imagine that the flame of a powerful rocket motor shoots up not onto the expanse of the Baykonur steppe, but into the "belly" of a powerful magnet. Incandescent gas at a high temperature, as is known, is ionized and becomes conducting. And when it races about in a magnetic field, a constant electrical current should begin to flow across the stream of fire.

The Soviet Union is the recognized leader in the development of the new method of transforming thermal energy into electric power. The first powerful pilot industrial plant in the world, the "U-25," on which all the conditions of the operation of the future MHD electric power plant are being modeled, was developed in our country at the Institute of High Temperatures of the USSR Academy of Sciences (IVTAN).

Here the high-speed incandescent flow of gases gives rise to an electric current in the MHD channel, and then is sent to the second stage of the plant, at which it works once again in the classical chain of the thermal electric power plant: the boiler--the turbine--the electric generator. Thus, a double crop of electric power is as if gathered in the plant. After conversion into a standard alternating current the electric power is fed directly into the network of the Moscow Regional Administration of Power System Management. In this way it is possible to study the entire power engineering chain.

Many difficult engineering problems still lie ahead, but the lengthy experiments, which were conducted at this plant, have already made it possible to begin the production of the first commercial block of the MHD electric power plant. It is now being built in Novomichurinsk at the Ryazanskaya GRES, which is located 80 kilometers from the ancient Russian city. The installed capacity of this block is 580,000 kilowatts. Of them 270,000 kilowatts are the share of the MHD generator, while 310,000 kilowatts are the share of the classical steam power plant. This is already a large industrial scale and a decisive step in the direction of the development of series-produced MHD electric power plants.

But no matter how important this new construction project is for power engineering, for the country, perhaps, it is even more important that here a new form of the cooperation of academic science with the sector is also being simultaneously developed. The Interdepartmental Scientific and Technical Center for the development of the fundamentally new direction was established for the first time by a joint decision of the USSR Academy of Sciences and the USSR Ministry of Power and Electrification.

Without Departmental Barriers

The wisdom and necessity of such cooperation seem obvious. Nevertheless this is the first experience of such close association. And honestly speaking, I wanted most of all to understand why it became possible. For this idea was in the air for a long time. Attempts of this sort were made more than once. For example, I remember that Chairman of the Siberian Department of the USSR Academy of Sciences Academician V.A. Koptyug and First Secretary of the Novosibirsk Oblast Committee of the CPSU A.P. Filatov addressed to Minister of the Chemical Industry V.V. Listov the suggestion to unite the Institute of Catalysis of the Siberian Department of the USSR Academy of Sciences and the Special Design and Technological Bureau of Catalysts of the Ministry of the Chemical Industry, which had been built in Novosibirsk among the other design bureaus which belong to what is called the "belt of introduction," for the rapid implementation of academic developments. It was suggested that the association, as before, would solve all the sectorial problems set down for the special design and technological bureau and, in addition to this, the

intersectorial problems of the development in the country of catalytic technologies. The Ministry of the Chemical Industry declined. Valid reasons were found. This is a matter of the past. But now, too, the talks on the uniting of subdivisions of other ministries with academic institutes for the present are proceeding with difficulty, although now the party is directly appealing to departments for such cooperation.

The main barrier, apparently, still lies in the fact that the Academy of Sciences, as a rule, proposes to put in the "common pot" as if intangible things--knowledge, the experience of scientists, promising ideas, while the ministries should share the production capacities, which for the present are yielding a product which is quite tangible for the plan. And the ministries prefer "a bird in the hand to two in the bush."

And now the ice has begun to break. Why? Have they finally begun to believe in the value of "two in the bush"? Yes, apparently, this also played a role. The reorganization taking place in the country and the party policy of the careful consumption of resources forced them to look in a new way at the importance of the problem of developing MHD electric power plants. But this would be too simple an explanation. In other instances, after all, it is proposed to solve problems which are no less important for the national economy. Nevertheless narrow departmental interests prove to be stronger than common sense and state necessity.

It must be said that the Institute of High Temperatures is one of the largest in the USSR Academy of Sciences. About 3,500 people work here. And they not only engage in basic research, but also bring valuable ideas up to ready technology. But, as is known, scientific ideas are quite easily set forth in special journals, are willingly presented to international conferences, while the technologies, which have been developed on their basis, are already being sold for large amounts of money or are valued so much that they are not liable at all to sale and even are becoming an object of industrial espionage.

The Institute of High Temperatures has a powerful design bureau, a pilot works, and a developed experimental complex, the task of which is the final "making sense" of developed technologies and devices. Therefore, it is unlike ordinary academic institutions and for the Ministry of Power and Electrification is attractive not only as the developer of a new idea, but also as the producer of equipment for its implementation.

But this is unique equipment which does not have analogues in the practice of world and domestic power machine building. Indeed, the MHD generator is as if an electric machine, but let us recall that within it a rocket flame with a high temperature and powerful heat currents is racing around with enormous speed, and, finally, we have not seen in our age such electrical equipment. For power machine building, on the contrary, high temperatures in a device are customary, but gigantic electric currents and the high stress, under which, for example, the combustion chamber is, are quite uncustomary. Therefore, neither the Ministry of the Electrical Equipment Industry nor the Ministry of Power Machine Building at first wanted to take the new matter entirely upon itself.

Nevertheless the Elektrosila Plant made the MHD generator for the "U-25" experimental plant. And although for the Ryazan block it is not much more complicated, General Director of the Elektrosila Plant B.I. Fomin, in spite of the previously given promises of the management of the Ministry of the Electrical Equipment Industry, in practice refused to produce the commercial MHD generator. It turned out that the Ministry of Power and Electrification was itself forced to make the new unique power equipment for itself. And, of course, in this situation the advantage of combining efforts with the Institute of High Temperatures becomes obvious.

These objective and subjective factors had the result that the first interdepartmental scientific and technical center came into being. Quite a large number of organizations became a part of it. From the Ministry of Power and Electrification--Atomteploelektroproyekt (the general designer), the Energotekhnika Pilot Enterprise, the Gorizont Special Design Bureau (the production of cable for the superconducting magnet), the Power Engineering Institute imeni Krzhizhanovskiy, and the board of directors of the MHD electric power plant under construction, and from the USSR Academy of Sciences--the main organization of the project--the Institute of High Temperatures of the USSR Academy of Sciences and, moreover, the Institute of Machine Science, the Institute of Silicate Chemistry, as well as the Institute of Problems of Modeling in Power Engineering of the Ukrainian SSR Academy of Sciences.

But there was no painful break up of all the participating organizations when uniting. Everyone kept working at their institutions, receiving there the wage and enjoying all the benefits established for them. Now a magnetohydrodynamic sector will simply be singled out in the structure of each organization which is a part of the interdepartmental center.

A clear task has been set for all of them--to develop a commercial MHD power-generating unit for the Ryazanskaya GRES. To solve for this the necessary scientific and technical problems and to demonstrate that it is possible to begin the series use of units of this sort in power engineering. As you see, this is, in essence, an entire scientific and technical program.

The development of MHD electric power plants was always carried out in conformity with comprehensive scientific and technical programs, which were approved by high instances--the USSR State Committee for Science and Technology, the USSR State Planning Committee, and the USSR Academy of Sciences. The assignments were described in detail for various ministries, but nevertheless many of them were upset. There were not enough of the necessary levers of influence for the speeding up of the work. Now they are appearing.

In the plan of the building of the MHD electric power plant not only is the goal formulated, but there is also a personally responsible manager of the program. The USSR Council of Ministers appointed Director of the Institute of High Temperatures of the USSR Academy of Sciences Academician A.Ye. Sheyndlin general designer of the commercial MHD power-generating unit of the Ryazanskaya GRES. He is in charge as a whole of the work of the MHD sectors

of all the organizations which are a part of the interdepartmental center. The general designer has two deputies. Candidate of Technical Sciences D.F. Protsenko, a member of the Collegium of the USSR Ministry of Power and Electrification and chief of the Main Administration of the Exploitation of Power Systems of the Center, is in charge of the work of ministerial organizations, while Candidate of Technical Sciences S.I. Pishchikov, deputy director of the Institute of High Temperatures of the USSR Academy of Sciences, is in charge of the work of academic organizations.

The management of the project has been given not only duties, but also considerable rights. The USSR Academy of Sciences and the USSR Ministry of Power and Electrification have placed at the disposal of the general designer assets for the performance of operations, as well as for the payment of bonuses to its participants for the quick and high-quality fulfillment of the assignment. Moreover, the share of the bonuses is very significant--approximately one-tenth of the allocated assets. Material and technical supply are taking place through customary channels of the USSR Academy of Sciences and the Ministry of Power and Electrification. But, in addition, the general designer can go directly to the USSR State Planning Committee and the USSR State Committee for Material and Technical Supply with requests on the supply of the project, and they are obliged to give him "a green light."

The Ministry of Power and Electrification is carrying out the construction, including the construction of a special building with an area of 20,000 square meters, in which all the equipment necessary for the production of the MHD generator will be housed. And in addition, of course, tens of plants of the country will work through cooperation.

During the coming five-year plan the steam power stage of the block, then the MHD generator should provide a commercial current, and the stage of trial operation will start.

What Is Beyond the Horizon?

The question naturally arises: But what is next? What, will the scientific and technical center cease its existence at this? No. The MHD unit of the Ryazanskaya GRES will operate on natural gas. But the use of coals at the MHD plants is much more important for thermal power engineering. Work of this nature is already being performed in the country. The analysis, which was made by the USSR Academy of Sciences jointly with the USSR Ministry of Power and Electrification, shows the possibility and advisability of the extensive use of MHD electric power plants which operate on solid fuel, including the coals of the Kansk-Achinsk Fuel and Power Complex. MHD generators can and should operate in tandem with nuclear electric power plants, finally, thermonuclear electric power plants are practically inconceivable without them. So the Interdepartmental Scientific and Technical Center will not be left without important tasks.

It is a question of something else. When MHD power-generating units should be built in series, in reality the question of the establishment of a new subsector of power machine building will arise. At first the Interdepartmental Scientific and Technical Center, apparently, can also take

part in the solution of production problems. But in the future, according to forecasts, the capacity of the operating MHD electric power plants may come to many tens of millions of kilowatts. No scientific and technical center, of course, will cope with the supply of such capacities with MHD generators. Large-scale industrial production is already needed here, and it will be necessary to involve specialized ministries. The sooner this happens, the better.

They have already understood this in the Ministry of Power Machine Building. Now various scientific and production organizations of the sector are in fact already taking part in the development of the steam power part of MHD electric power plants. They have the desire to broaden cooperation and to become a legally equal member of the Interdepartmental Scientific and Technical Center. Of course, it is possible only to welcome this. And it has to be regretted that for the present the Ministry of the Electrical Equipment Industry is not displaying such an interest.

This is not the first five-year plan that the problem of the use of the magnetohydrodynamic method of transforming energy has been on the agenda. There has now appeared among all the participants in the project the confidence that it will finally be solved, and at the same time a new form of the organization of the state conveyor of the introduction of the most important interdepartmental developments for the country will be developed.

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FACILITIES AND MANPOWER

LVOV VOLUNTARY INTERDEPARTMENTAL COMPLEXES, ASSOCIATIONS

Moscow IZVESTIYA in Russian 21 Nov 85 p 2

[Interview with First Secretary of the Lvov Oblast Committee of the Communist Party of the Ukraine and USSR Supreme Soviet Deputy Viktor Fedorovich Dobrik, by IZVESTIYA special correspondent V. Vukovich under the rubric "Attention: Experience" (Lvov): "Bridges of Cooperation. Over the Barriers of the Isolation of Science and Production"; date not given; first paragraph is IZVESTIYA introduction]

[Text] How is one to overcome the isolation of science and production? How is one to see to it that a long and at times difficult period of introduction would not lie between a valuable development and its optimum implementation? How is one to form unified collectives of scientists and specialists of industrial enterprises of various departments and to aim them at the achievement of specific end results? These and other problems of the development of scientific and technical progress are being solved at the interdepartmental complexes and associations, which have been established in Lvov on a voluntary basis. Our correspondent conducts an interview with First Secretary of the Lvov Oblast Committee of the Communist Party of the Ukraine and USSR Supreme Soviet Deputy V.F. Dobrik on the experience of their work.

[Question] Viktor Fedorovich, it would apparently not hurt to make a brief digression into the recent past and to explain what brought into being the complexes and associations on a voluntary basis.

[Answer] First of all let us turn to the draft of the Basic Directions. In them the task is specified: "...to develop such organizational forms of the integration of science, technology, and production, which make it possible to ensure the prompt and quick passage of scientific ideas from emergence to extensive use in practice."

In Lvov there are substantial scientific forces. We have 13 institutions of the Ukrainian SSR Academy of Sciences, 24 sectorial scientific research institutes, 12 higher educational institutions, and about 70 planning, design, and technological organizations. About 40,000 people are employed at them. However, having confined themselves to departmental walls, many collectives, although they have done much, frequently duplicated each other. And this, naturally, led to the waste of labor and assets. It is even worse that new

developments did not find extensive use at the shops of enterprises. And there is a convincing explanation for this. The participation of highly skilled electronics experts, mathematicians, engineers, physicists, economists, and sociologists, in general, specialists of different types is needed to introduce the results of a serious study or a valuable development. But some scientific organizations have a handful of them, they are not present at all at industrial enterprises. Here is what happened: given the as if rich "bank of ideas" it was not possible to change over to the modern style the technological processes at entire works and to produce complex types of products with new consumer properties. So they arrived at the need to establish interdepartmental complexes: instrument making, geological and geophysical, machine building, and others, which are based on contractual principles. Academic and sectorial institutes, design and technological subdivisions, higher educational institutions, and enterprises belong to them. Today there are tens of scientific production associations within the complexes. Such ones as the Ekran, Sistema, Medelektronika, Neft, and others.

[Question] What is the practical purpose of formations of this sort, on what basis is their work organized, who manages them?

[Answer] I will note at once that the complexes and associations seemed to us as bridges of cooperation over the barriers of the isolation of science and production. In establishing them, we strove not to mechanically unite the interests of scientists and workers of industry, but to merge them fundamentally, that is, we strove for a new quality, which would make it possible to undertake the solution of major problems of sectorial and regional importance by joint efforts--of scientists, economic managers, party and state organs. As for the problems, more than enough of them were identified. Therefore, a comprehensive plan of the acceleration of scientific and technical progress was drafted for the entire five-year plan.

However, the plan is not yet everything. It was backed by contracts of the parties for the entire period of the fulfillment of what had been planned. The main organization was specified in the contract. Its duty is to organize the entire process from research and the development of the design to introduction at a specific works.

Councils made up of representatives of the interested parties manage the associations on a voluntary basis. They plan the stages of the overall process of work, deal with special-purpose financing and material and technical supply, and, if the need arises, establish temporary joint laboratories. Of course, the question arises: Where do the public organizations get finances, who supplies them with the necessary materials, how is their activity included in the planned economy? The client ministries make finances and materials available, within the framework of the fulfillment of the sectorial plans.

Each complex has its own collegium made up of representatives of scientists, party and soviet organs, and managers of the enterprises. The collegium--a leading scientist usually heads it--also works on a voluntary basis. The Western Scientific Center of the Ukrainian SSR Academy of Sciences and the council for the promotion of scientific and technical progress attached to the

oblast party committee carry out the coordination of the activity of the named formations.

[Question] Sufficient examples, which show how appreciable the return of the creative alliance of science and production, which has been organized in a new way, is, have been accumulated. On which of them would you like to dwell?

[Answer] Let us turn to the Ekran Association. In it there are 15 collectives--research and design collectives, collectives of higher educational institutions, production collectives. They are implementing on a contractual basis the "Quality of Electron-Beam Instruments" Comprehensive Program. For it the union ministry has allocated limits on labor and financing and has made a powerful computer available. The following directions of work were selected: the automation of designing and the optimization of technical processes. Results are already available. Cathode ray tubes were developed several fold more rapidly than before, moreover, from domestic materials, which in turn made it possible to begin the production of third-generation color televisions. The obtained impact exceeded the expenditures by tens of fold.

It is not necessary to speak about the importance of the increase of coal production, rather, about the construction of new mines. However, a large tool, which was not made in our country, was urgently needed for the sinking of the vertical shafts of these underground enterprises. The machine building complex set to work on a responsible order: to develop and bring up to introduction a tool capable of "gnawing through" hard rocks. It is also possible to use it in the driving of tunnels. The difficult scientific and technical problem was solved. The coal miners are already receiving a batch of items, while mass output will start with the completion of the construction of the enterprise. The USSR State Planning Committee has released capital investments for it.

The cost of drilling exploratory and producing petroleum and gas wells, as well as in hard to reach regions, to a certain extent depends on the quality of labor. The creative search of scientists, as well as specialists of the Drogobych Experimental Machine Plant of Special Equipment merits praise. Casing pipes were produced at it. When they used an innovation--a set of induction devices--for their heat treatment, the life of the items increased by more than sixfold. Hence, it is possible to speed up significantly the drilling of wells. However, the research work is being continued.

In general, since the time that researchers and developers linked themselves more closely with the everyday life of enterprises, it has been possible to take an appreciable step forward. For example, a large number of instruments, which do not have analogues, were developed, a family of new materials appeared, many technological processes were improved. You will not list everything. It is possible merely to add: if you take as a reference point the beginning of the five-year plan, the economic impact from everything that has already been introduced has amounted to about 7 rubles per ruble of expenditures.

What was said above should not at all dispose us to complacency. As is known, the new forms of the organization of scientific and technical progress, which speed up the introduction of the achievements of science in the national economy, are aimed first of all at the sharp increase of labor productivity. Unfortunately, it is still not always possible to fully implement this principle in practice. Not all the complexes and associations are operating as one would like. Much work lies ahead here. But we are exerting all efforts so that the already built bridges would be strengthened and would give a significant return for the economy.

[Question] The people coming to Lvov are acquainting themselves with the regional form of the management of scientific and technical progress, which has been established in the oblast, and are showing an interest in the activity of the Zdorovye Scientific Complex....

[Answer] This complex is implementing a program on the increase of the life expectancy and labor activity of the population. Of course, it was necessary to deal with the various interconnected problems. The work was not in vain. During the past few years the labor of 92,000 people has been saved. The level of the sick rate per 100 people was reduced to one-half. The nonproductive losses of working time in industry and in construction were reduced.

The gained experience suggested another, more large-scale idea. "The Increase of the Quality of the Labor Potential" Goal Program for the 12th Five-Year Plan and the period to 2000 has already been prepared. The very fact that scientific research institutes, higher educational institutions, specialists of health care, public education, culture, and industrial and agricultural enterprises, and workers of party and soviet organs participated in the formulation of the program, testifies that serious steps are being taken for the improvement of the qualitative characteristics of manpower resources.

[Question] What do you think of the present and future of the complexes and associations, which emerged independently? How are they blending with the prevailing economic mechanism?

[Answer] At the conference on questions of the acceleration of scientific and technical progress, which was held in June, General Secretary of the CPSU Central Committee M.S. Gorbachev said: "...it is necessary to look at the tasks of science in a new way, through the prism of the requirements of the times--the requirements of its resolute turn toward the needs of social production, and of production toward science." The complexes and associations, which have been established here, give grounds to believe that one of the effective forms of the contact of science and production has been found.

As to the future of our complexes and associations, their very appearance, as well as what has been done urgently require a completely different attitude toward them. For the present they exist on a voluntary basis, and this, of course, is creating a chain of difficulties of all sorts. Perhaps, the time has come to develop the legal status of such scientific research formations on a voluntary basis.

There is something to think about here, if we absolutely want to achieve the acceleration of scientific and technical progress.

7807

CSO: 1814/53

TRAINING AND EDUCATION

TYPES OF TRAINING OF SCIENTISTS EXAMINED

Tallinn SOVETSKAYA ESTONIYA in Russian 25 Sep 85 p 2

[Article by Doctor of Economic Sciences V. Rayangu: "Who Is to Be a Scientist?"; first three paragraphs are SOVETSKAYA ESTONIYA introduction]

[Text] The basic resource of science is its personnel. The constant influx to institutes of people, who have been trained for research work, and creative and resourceful young specialists is necessary.

Graduate studies as the main form of the training of young scientists should today clearly visualize the factors which influence its efficiency.

The article offered below is about this and other aspects of the training of scientists.

In our republic there are about 7,000 scientists. Of them 2,800 (or 40.6 percent) have the academic degree of candidate of sciences and nearly 300 (4.3 percent) have the academic degree of doctor of sciences.

Mainly graduate studies train candidates of sciences, they exist in our republic at 21 scientific institutions and higher educational institutions, the total number of graduate students exceeds 1,500, and a large portion of them (60 percent) are studying at higher educational institutions.

Training in special-purpose graduate studies at scientific institutions and higher educational institutions of other union republics is being used for the specialties, in which graduate studies are absent in Estonia, but the corresponding personnel are needed. Thus, 25 people are studying along the line of our Ministry of Higher and Secondary Specialized Education in Moscow and Leningrad, nearly the same number are studying along the line of the Estonian SSR Academy of Sciences. The Ministry of Health, the Ministry of Culture, the Ministry of Light Industry, and the State Planning Committee also have their own graduate students outside the republic.

The training of scientists is a lengthy process. Training in graduate studies alone lasts 3 or 4 years, depending on the form of instruction--full-time or by correspondence.

It must be stated that far from all graduate students get through in time. At the academic institutes in 1983 only 1 person in 16 defended his dissertation during training in graduate studies. Only 22 percent of the graduate students submitted dissertations on time, among the remainder the work was not prepared. At higher educational institutions there is approximately the same picture. Such a low efficiency of graduate studies was characteristic for a large number of years, which made it incumbent to look more seriously at this problem.

As a result of the increase of the demandingness on the work of graduate students at the institutes after a year approximately one graduate student in five already defended himself on time. However, is this the limit? For comparison: at the Leningrad Electrical Engineering Institute, where 150 people are admitted annually to graduate studies, on the average by their completion 70 percent of the graduate students defend a dissertation.

It is very important that the minimum requirements of a candidate degree would be passed by a person, wherever possible, before enrolling in them. In recent years a positive trend has been noted: about two-thirds of those who have enrolled in graduate studies from higher educational institutions of the republic by this time have already passed in full or in part the examinations on the minimum requirements of a candidate degree. Four out of every five people admitted had published scientific works or student competitive works. All this, undoubtedly, is a definite reserve for successful graduate studies, in which first of all regular work on a tight schedule is required.

The annual certification of graduate students, as is known, serves as a check of this work. However, experience shows that in many instances it is carried out formally, without ascertaining the actually performed amount of work. In practice all 100 percent of the graduate students are certified, but after the term of graduate studies it turns out that on the average 1 person in 3 or 4 cannot submit a finished dissertation, not to mention its defense.

There are still many reserves in the matter of training scientists, starting with the early attraction of young people to science with their subsequent sending to graduate studies. Here the Institute of Physics and the Institute of Cybernetics of the Estonian SSR Academy of Sciences can serve as an example for others. The Chair of Solid State Physics of Tartu State University has been organized at the former, while the Chair of Cybernetics of Tallinn Polytechnical Institute has been organized at the Institute of Cybernetics. It is clear that with the aid of these chairs the training of students is being carried out with the use of the modern scientific arsenal of the academic institutes. The students master the specifics of scientific work and, when choosing a field upon graduating from the higher educational institution, frequently decide consciously in favor of science. This experience has also found a positive rating on the all-union scale.

For more than 5 years now the scientific society of students with sections in 26 fields of science has been operating in the republic. All those who want to are admitted as candidates of it, but only the most diligent of them, who have implemented their knowledge in an entrance work, can become members of the society. For all the diversity of the forms of activity of the society

(excursions to institutes, meetings with scientists, competitions, seminars, expeditions, educational camps) the individual scientific research work of school children under the supervision of scientists--at real laboratories of institutes or higher educational institutions--remains the basic one.

In this way the young people, who are capable of scientific work, are also identified, the skills of and an interest in independent research are inculcated in them, a scientific world outlook and an active position in life are cultivated in them. The society gives its entering members recommendations for enrollment in higher educational institutions. As a rule, these children later also actively participate in the student scientific society.

Higher educational institutions, in turn, have also found a good form of work with students--in various groups under the supervision of instructors and scientists. Thus, 20 technical groups, in which 350 youngsters from 31 educational institutions are studying, are operating at Tallinn Polytechnical Institute. The organizers of these groups are convinced that such work, undoubtedly, influences the conscious choice by youngsters of an occupation, including in science. This work, which was started at Tallinn Polytechnical Institute, merits the highest rating, especially now, when scientific and technical progress in the country is picking up speed and a special role is being assigned to engineers and scientists, who are employed in technical fields of knowledge. (However, so far the training of scientists of these fields does not completely satisfy in our republic the present requirements: of those engaged in the technical sciences only 1 percent have a doctoral degree and a little more than a third have a candidate degree. There is the hope, it is true, that in the future several taken steps will improve the matter. But about this below.)

Work in the student scientific society and in the special design bureaus of higher educational institutions, the participation of students in economic contractual scientific operations, in various scientific competitions, conferences, and so on are also conducive to the choice of the occupation of scientist.

However, when coming to work at an institute, a young person for a long time will remain a novice in science, if he is not immediately involved in the atmosphere of the most advanced ideas and quests, which move this field of research. In this respect the permanent seminars and conferences of young scientists--chemists, physicists, economists, and so forth--play an important role in the formation of the researcher. Young economists, for example, for 7 years in a row have held their own republic seminars with the publication of collections of heads of reports. The Club of Young Economics Scholars attached to the Economic Science Society is the organizer of these seminars.

In the work with scientists in our republic the training of doctors of sciences remains the weak point. Frequently the writing of a doctoral dissertation is considered the personal matter of the scientist or instructor--in other words, they do not receive in this the proper assistance from the institution at which they work. In the republic at present there are no doctors in the field of pharmaceutical and psychological sciences. Not one

doctoral dissertation on geography has been defended since 1971, on art criticism--since 1973, in the field of the agricultural sciences--since 1978. The average age of doctors of sciences is increasing: only 20 percent of them are under 50. Toyvo Arrak of the Institute of Cybernetics of the Estonian SSR Academy of Sciences, Peeter Saari of the Institute of Physics of the Estonian SSR Academy of Sciences, Rikhard Villem of the Institute of Chemical and Biological Physics of the Estonian SSR Academy of Sciences, Toomas Karyakhyarm of Tallinn State Conservatory (doctor of historical sciences), Aleksandr Dulichenko of Tartu State University (doctor of philosophical sciences), and Andrus Pork of the Institute of Economics of the Estonian SSR Academy of Sciences (doctor of philosophical sciences) are among the youngest doctors of sciences in the republic. By means of purposeful work at several higher educational institutions and institutes it has been possible in recent times to decrease the average age of the people who have defended a doctoral dissertation.

The front line of the campaign for the acceleration of scientific and technical progress, as Comrade M.S. Gorbachev noted at the conference in the CPSU Central Committee, passes through science. Science can fully realize itself only when the appropriate personnel have been trained for it.

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CSO: 1814/35

TRAINING AND EDUCATION

TRAINING OF SPECIALISTS IN NEW TECHNICAL FIELDS

Moscow PRAVDA in Russian 20 Nov 85 p 3

[Article by A. Sysoyev, professor of the Moscow Engineering Physics Institute, dean of the Faculty of the Retraining of Personnel in New, Promising Directions of Science and Technology: "The Specialist for Tomorrow. Thoughts on the Retraining of Personnel"; first paragraph is PRAVDA introduction]

[Text] Let us face it, just recently the very concept "the improvement of skills" was identified with a week or two of sleepiness at survey lectures, with a kind of unplanned leave. Under the conditions of the policy adopted by the party of the intensification of production on the basis of the latest achievements of scientific and technical progress the formation of personnel, who are capable of taking up scientific achievements and implementing them, is impossible without serious retraining.

The faculties of the retraining of personnel in new, promising directions of science and technology at the leading higher educational institutions of the country, in particular, are serving this task. At the Moscow Engineering Physics Institute specialists of various sectorial institutes of Moscow are improving their knowledge in such urgent directions as "The Automation of Experimental Research," "Laser Technology," "The Automation of Designing," and "Microprocessor Systems." I want to share the observations and concerns which are connected with the work of our faculty.

I remember a noteworthy conversation with the chief of a laboratory of a major scientific research institute. I asked why he was striving so stubbornly to enroll in the faculty. The response was entirely in tune with the times: "The management is making it incumbent to reorient the laboratory toward the development of new equipment, but I lack knowledge in this area. I do not sense the tasks which have been set for me. It is necessary to realize in a short time and thoroughly what is to be done and how."

This is a quite obvious explanation, although versions are also encountered. Some people want to pick up knowledge for enrollment in graduate studies, some people--for a dissertation. Some people openly admit: "I notice that young people know more than I do, but it is awkward for a manager to lag behind...."

One must give their due the students who, in spite of difficulties of a production and everyday nature (instruction at the faculty is partially in the evening), persistently and successfully master fields of knowledge, which are new for them. Moreover, both those, who have just begun independent work, and those, who have a length of service in their sector of 20 years and more, are not inferior to each other. It is a sign of the times: at present with each year the number of applications submitted to the faculty is increasing significantly. This year students at the level of deputy director, chief engineer, chief process engineer, and chief designer of enterprises came to us for the first time.

The faculty has increased by twofold the acceptance of students, especially for new specialties which are connected with the automation of designing and microprocessor and computer technology. The curricula are organized with allowance made for the needs of the audience.

The traditional survey of graduates confirms that during the time of training they acquired an understanding of new problems and of the methods of their solution. The graduation works are frequently devoted to the development of new devices, some are carried out at the level of inventions.

It would seem that there are real advantages which such a faculty brings enterprises. However, so far the overwhelming majority of applications for admission are the personal initiative of specialists, and not at all of the administration. Frequently the students are faced with elementary inattention to their concerns and needs. Leaves of absence at an inconvenient time, frequent absences from classes, and even postponements of examinations and graduation works due to business trips--everything testifies to the lack of coordination in the "enterprise--student--faculty" triangle.

But it should be the other way round. The economic and technical policy of the enterprise should be continuously coordinated with the personnel policy. And, while being concerned about the development of production on a modern basis and about intensification and retooling, the enterprise is also obliged to be concerned about the development of its intellectual potential. The plan of the retraining of specialists should inevitably grow out of the plan on the development and introduction of new equipment. To rely here on personal initiative means to let this important matter take its own course.

The equating of our students with ordinary evening students is also completely unjustified. Educational leave is paid for in the same way as they are paid for it, within the limits of 100 rubles, while for the graduation work even less is paid. With allowance made for the practical return of our graduates it is necessary to eliminate these moral and material inconveniences.

Recently one colleague--an instructor of a higher educational institution--asked: Is it possible to attend classes as an elective? We reply "no." But why does he not enroll in accordance with all the rules? It turns out that in this case in conformity with the instructions of the USSR Ministry of Higher and Secondary Specialized Education he is deprived of the opportunity to take part in economic contractual themes. That is why among our students there are practically no instructors of higher educational institutions. How, one would

like to know, will new knowledge interfere with economic contractual work? It is difficult to trace the source of these instructions, but one thing is clear: it is necessary to regulate scientific work not by means of artificial restrictions, but by the accountability for the result.

In essence such a faculty is a sensitive detector of what is new in science and industry. The formulation of its curriculum is an extremely complicated task, which requires of instructors both thorough knowledge and extensive information on events in the scientific and technical world. The dynamism of the development of science requires the regular revision of the subjects being taught. But the process of approving the curriculum is too sluggish to keep pace with events. Such strange things also happened when by the time of approval in the USSR Ministry of Higher and Secondary Specialized Education our curriculum had to a considerable extent become obsolete and we involuntarily for the good of the matter went from its developers to its violators. It is necessary to attach to the faculties the right without unnecessary consultations to change dynamically the curricula in the course of instruction, directing attention to the achievements of science and technology and the needs of enterprises.

A flexible system of the updating of the curriculum, a competent and interested audience, close and effective feedback with scientific institutions and enterprises--the usual process of the higher educational institution also needs all this. Therefore, I would like to see the retraining faculties as a kind of reconnaissance unit in the system of higher education and a forge of new ideas, specialties, and specializations. There is an objective criterion here: the promise of a new direction is immediately reflected in the number of submitted applications. It is not by chance that at present at the Moscow Engineering Physics Institute in the day faculties there are specializations, which originated and were road tested in the retraining faculty. Such was the case with the specializations "The Processing of Measuring Information on Computer," "Computer-Aided Design Systems," and others.

From this it follows that it is necessary to assign more boldly to such faculties the functions of kinds of scientific research laboratories for the road testing of new specializations, their methodical development, and introduction in the nomenclature of specialties of the system of higher education. These operations can be performed in accordance with assignments of the USSR State Committee for Science and Technology and interested ministries and departments up to an economic contractual basis.

Unfortunately, our faculties for the present are being provided with microprocessor and computer equipment as poor relatives. But it is impossible, of course, to solve the problems which were discussed without the strengthening of the material base.

It is necessary to create such conditions so that the leading scientist-instructors would aid the formulation of scientific and technical policy at enterprises. Its bearers are students and participants in new technical and technological developments which have been carried out on the basis of the obtained knowledge. The practical orientation of course projects and practical laboratory work, close and attentive contact, and the identification

of feedback require the development of individual forms of instruction. The expenditures of efforts and time on lessons under such conditions are appreciably greater. Here are the words of one of the professors, who has been giving lectures here practically since the day of founding: "Whereas for students 15 minutes is sufficient for preparation for lectures in a course, which has been given for 2-3 years, in the retraining faculty each time I prepare for the lecture as if I am giving it anew, and a whole day is spent on preparation."

It would be correct, and from the point of view of the training of such valuable personnel simply necessary, to revise the norms of the workload of instructors, having concentrated it on more productive individual and practical work.

Perhaps, one should also agree more boldly to an economic experiment at the higher school, and the retraining faculty is an opportune test base for this. How, for example, is the remuneration of the labor of the instructor to be linked with the end result of his labor? Why should it not be as follows: a group of instructors, which has been authorized by the institute, in accordance with a contract with the enterprise takes upon itself the training of a set number of specialists who solve a specific scientific and technical problem. On its part the enterprise provides the material base and creates the conditions for the use of the latest equipment in the process of training. A portion of the profit, which is derived from the sale of the development, is transferred to the institute. The Moscow Engineering Physics Institute has some experience in the organization of training on the basis of contracts with enterprises. It is an important and necessary matter to improve and develop this experience.

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AUTOMATION AND INFORMATION POLICY

COVERAGE OF S&T PROGRESS BY DONESTSK OBLAST NEWSPAPERS

Kiev PRAVDA UKRAINY in Russian 7 Sep 85 p 3

[Article: "From the Idea to Introduction. A Survey of the Press"]

[Text] Does the editorial office of a newspaper need an irregular department of the mechanization of mining in steeply inclined seams? Will journalists be able to understand the complexities of coal production, which poses riddles even for experienced specialists and miners with a long length of service?

Similar questions initially arose among many readers who learned that the oblast newspaper SOTSIALISTICHESKIY DONBASS had begun a study of the problems of coal mining in steep seams. But soon the doubts were dispelled. The publications of the irregular department, which united competent authors, interested many miners. The materials under the rubric "The Review of the Introduction in Production of Scientific and Technical Achievements" attract attention with a practical approach to the theme and an orientation toward urgent problems.

It is possible to be convinced of this, for example, having read the report "Why the Heading Machines Are Idle." Its authors--A. Maslenikov and I. Lubenets, chief specialists of the Ordzhonikidze Coal Association--presented interesting views on the completely mechanized mining of coal with the use of heading machines. As practical experience shows, these units make it possible to increase appreciably the productivity of the labor of miners and to decrease the cost of the fuel being mined. However, many obstacles are still in the way of heading machines. In particular, there are not enough spare parts for them and not everything is being done for the timely repair of coal equipment. Therefore, the superior economic organs, it is emphasized in the report, should take immediate steps for the establishment of order.

The editorial office of SOTSIALISTICHESKIY DONBASS is not confining itself to the identification of shortcomings. It is persistently striving for their elimination and the improvement of all the work on the introduction in production of scientific and technical innovations. Spot checks of public correspondents, who with the assistance of leading specialists and scientists analyze how the technical updating of enterprises and the introduction of advanced technologies and advanced methods of labor are going, are made

regularly. In accordance with the results of the public checks the newspaper prints articles, reports, and socioeconomic feature stories.

For example, the material "The Cost of Designers' Miscalculations," in which N. Nikolin, operator of a tunnel boring machine of the Dzerzhinsk Coal Association, lodges valid complaints against the RKG coal mining complex, which was developed by Donetsk designers, is distinguished by a practical nature. Weighty facts are cited in the report "At Odds With the New Equipment"--here the editorial office returns to the questions of the use of heading machines in shafts.

After the April (1985) CPSU Central Committee Plenum the newspaper SOTSIALISTICHESKIY DONBASS increased the attention to the concerns of the enterprises of the base sectors of the economy. A meeting of representatives of metallurgical plants, combines, and the Donetsk Scientific Research Institute of Ferrous Metallurgy was held at a round table of the editorial office. During the discussion it was emphasized that today it is necessary to strengthen even more the contact between scientists and production workers and to be constantly concerned about the rapid introduction of technical innovations in practice.

In the solution of this problem an important role also belongs to the newspaper, which can actively contribute to the implementation of scientific developments at metallurgical enterprises.

The readers received with approval the organization by journalists of SOTSIALISTICHESKIY DONBASS and the oblast television and radio committee of the public monitoring of the progress of the economic experiment at the largest enterprises of the oblast. Good responses to another action of the editorial office--the exchange of competing collectives, during which the work on the acceleration of scientific and technical progress, the intensification of production, and the saving of resources is being analyzed in detail--are also being received. Practical assistance is being given to the lagging enterprises.

The oblast newspaper RADYANSKA DONECHCHINA is also carrying out this theme in an interesting way. Innovators of industrial and agricultural production, designers and engineers, and competent scientists systematically appear on its pages. Their experience and considered suggestions on means of increasing the efficiency of the economy are aimed at the accomplishment of the tasks which were posed at the conference in the CPSU Central Committee on questions of the acceleration of scientific and technical progress.

The editorial office, in particular, is covering very convincingly the renovation of enterprises. It is worth mentioning as an example the thematic page on the experience of the intensification of production and its modernization, which has been gained at the Novokramatorskiy mashinostroitelnyy zavod Association, at the Donetsk Vzryvozashchishchennoye elektrooborudovaniye Scientific Production Association, and the Zhdanov Avostal Metallurgical Combine. The initiative of the labor collectives of these enterprises in July of this year was approved of at the buro of the oblast party committee. RADYANSKA DONECHCHINA showed in detail how the

initiators are implementing a comprehensive approach to the intensification of production, and organized the public monitoring of the use of their experience in other labor collectives of the oblast.

In recent times the newspaper has begun to cover more extensively the introduction of waste-free technologies and the campaign for the efficient use of metal, raw materials, and fuel, energy, and manpower resources. Economic feature articles and dialogues with experienced engineers, process engineers, and managers of industrial enterprises are being published. The interview with B.G. Tishchenko, chief engineer of the Slavyansk Ceramics Combine, has probably remained in the memory of the readers. He told convincingly about how much the retooling of production, the use of advanced technologies, and the formation of a new type of economic thinking among workers and specialists mean today. At the combine the accomplishment of these tasks has already yielded quite significant results: the output of scarce decorative ceramic tile has been increased, the productivity and quality of labor have increased, a large amount of raw materials and electric power has been saved. The labor collective of the enterprise has begun to work more smoothly and is exceeding the plan assignments.

The materials on the use in agriculture of industrial technologies and on the introduction of the collective contract at kolkhozes and sovkhozes of the oblast are meaningful. The editorial office has received many responses of readers, for example, to the economic feature story "You Have as You Manage" (on the experience of the Kolkhoz imeni Sverdlov of Volnovakhskiy Rayon) and to the problem report "So He Wants to Go to the Field," in which the introduction of the collective contract at the Kolkhoz imeni Gorkiy of Krasnoarmeyskiy Rayon is analyzed.

The Donetsk journalists are not stopping at what has been achieved. In the editorial offices of the newspapers SOTSIALISTICHESKIY DONBASS and RADYANSKA DONECHCHINA a search for new approaches to the theme of the technical updating of enterprises of ferrous metallurgy and machine building is under way, means of improving the demonstration of party supervision of the work on the acceleration of scientific and technical progress are being outlined. Topical articles on the questions of the integration of science and production and the formation among people of a new type of economic thinking are being planned.

The editorial collectives of the Donetsk Oblast newspapers are striving to cover the life of labor collectives and their preparation for the 27th CPSU Congress extensively and convincingly, so that the printed word would inspire people to labor and a creative search.

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INDUSTRIAL AND COMMERCIAL APPLICATION

INTRODUCTION OF DEVELOPMENTS IN AZERBAIJAN PETROLEUM INDUSTRY

Baku BAKINSKIY RABOCHIY in Russian 1 Nov 85 p 2

[Article by A. Nazaryan, senior engineer of the Azerbaijan Scientific Research and Planning Institute of the Petroleum Industry, under the rubric "Science and Production: What Is Preventing Introduction?": "Before the Departmental Barrier..."; capitalized passages published in boldface; first three paragraphs are BAKINSKIY RABOCHIY introduction]

[Text] The need to solve economic and social problems jointly, to ensure in planning the priority of statewide interests, and to put a resolute stop to any displays of departmentalism is spoken about in the draft of the new version of the CPSU Program.

The fact that not all our personnel have renounced the inertia of the old schemes, it was emphasized at the October CPSU Central Committee Plenum, is a serious problem. It is especially necessary to overcome such inertia in what directly concerns the acceleration of scientific and technical progress. Today persistence and consistency in the making of the turn toward intensity and quality are especially important.

The inertia of the old is the departmental approach to the introduction of the results of scientific research. In the solution of the problems of introduction it is necessary to proceed from the interests of the cause and to display flexibility. In many cases the specialization of research and design development is necessary, since the concentration of forces and assets and the union of creative personnel are being established. But at times different scientific institutions are busy with the same problems. This is not always the simple duplication of work. Frequently the turning of a scientific collective to a specific problem is due to the fact that either there are no solutions of it or they are unsatisfactory. It is important in such cases to overcome departmental barriers, to establish creative and business contacts of specialists, and to aim their joint efforts at the achievement of high end results. Unfortunately, this does not always turn out well. Such a situation is discussed in the article being published.

The method of recovery with the use of oil-well sucker rod pumps is widespread in the republic petroleum industry. Their development is the prerogative of the Neftemash Experimental Design Bureau, a single enterprise in the country--

the Machine Building Plant imeni Dzerzhinskiy--produces them. Both, as is known, belong to the Soyuzneftemash All-Union Industrial Association.

And it is immediately necessary, it seems, to speak about a most serious problem. The pumps produced by the association do not encompass all the categories of wells which are being operated in our republic. First of all the wells with the showing of sand, with an increased production of fluid, and with a setting depth of 1,500 meters "fall out."

Our institute is closely connected with petroleum- and gas-production administrations. We are well aware of how difficultly the solution of the problems of the increase of petroleum production and the period of the operation of wells between overhauls and the combating of complications comes at the fields. And it is clear that the collective of the Azerbaijan Scientific Research and Planning Institute of the Petroleum Industry cannot stand aloof of these problems. We are striving to help the machine builders, in particular, in supplying the oil field workers with reliable pumps. Work is being performed in various directions. One of the important ones is the assurance of the protection of the equipment. Thus, in recent times five designs of gas separators have been developed here. They are intended for the protection of the well pumps against the harmful effect of the gas which is contained in the liquid being pumped out. The separators are already operating in all 140 wells of the Leninneft Petroleum- and Gas-Production Administration, the Petroleum- and Gas-Production Administration imeni 26 bakinskikh komissarov, and the Azizbekovneft Petroleum- and Gas-Production Administration and at the fields in Salyany, Shirvan, and Neftechala. Owing to them an additional 5,000 tons of petroleum have been obtained, the economic impact has exceeded 2.2 million rubles.

At the institute they have engaged in earnest in research in the area of the increase of the reliability of pumps. It is worth telling in greater detail about the results of the work on one theme. As is known, the basic parameter, which determines the life of a pump, is the size of the initial clearance of its plunger pair. However, it was never checked due to the lack of the appropriate equipment at the fields. Methods and a device for measurements, which it is possible to make under the conditions of repair workshops, were developed at the Azerbaijan Scientific Research and Planning Institute of the Petroleum Industry. I will emphasize that great precision in the determination of the size of the clearance of up to 10 microns is ensured. The devices have already found use at the Leninneft Petroleum- and Gas-Production Administration, the Petroleum- and Gas-Production Administration imeni 26 bakinskikh komissarov, and the Central Repair Workshop of the Azneft Association. Their use has confirmed the calculations of the designers of the institute. Now it has become possible to select a pump on the basis of the characteristics of the well. The circumstance is of no little importance. Owing to this the lives of pumps and the periods of the operation of wells between overhauls are being increased, the number of underground repairs are decreasing. These devices are now being introduced at the Karadagneft Petroleum- and Gas-Production Administration.

Everything said for the present does not give grounds for anxiety. But in general the situation is arousing alarm. What is it a question of? Of the

fact that success far from always accompanies us. For example, in the development of new pumps, and not always through our fault. It is clear why our institute is undertaking the designing of equipment for petroleum production in the republic. I will emphasize that it is for especially difficult production conditions. The main reason is: for the present little such equipment is being produced and developed. It seems that already for this reason it is necessary to welcome the participation of specialists of various sectors in the development of this equipment. In practice our developments very often do not go beyond prototypes.

As a positive example I will cite just the following one. A pump with a flexible control unit, which increases the wear resistance of the valve unit, was developed at the institute. The designers in so doing clearly took into account the difficult conditions under which many wells in the republic operate. Moreover, they were able to facilitate and improve the technological processes of the production of the pump. As a result it was possible to reduce the consumption of metal and to decrease the labor intensiveness of production. Our pumps have been introduced at 3,500 wells.

But this is only one type of pump of the entire series of those, which were developed at the institute and the fate of which proved to be not so enviable. Back in 1979 it was planned to begin the series production of a special pump, for which the designers of the institute envisaged the protection of the clearance against sand getting into it and installed tubular rods for facilitating use at wells with the showing of sand. Tests showed that the use of the pump lengthened the time of the operation of wells between overhauls. However, it never went into series production. The appeal in this regard of the managers of the Azneft Association and the Ministry of the Petroleum Industry to the management of the Soyuzneftemash All-Union Industrial Association, unfortunately, led nowhere. And this is not the only case.

A group of pumps--with a magnetic plunger, as well as with self-centering and elastic plungers, with a two-way hydraulic separation chamber for pumping out high-viscosity petroleum, and others--was developed at our institute. Their tests at the fields of the Azneft Association and in Bashkiria showed that owing to them the lives of equipment and the period of the operation of wells between overhauls increased by 1.5-fold. No, we did not intend to undermine the authority of the machine builders. The Ministry of the Petroleum Industry turned over the technical specifications of our pumps to the Baku Neftemash Special Design Bureau so that there the specialists would bring them up to "condition." However, more than 3 years have already passed, while the documents are simply lying idle.

There are other examples. At the fields of the republic about 600 wells have a setting depth of 1,500 meters and more. In conformity with the sectorial standard insert pumps of the first group should be used for their operation. Such a design was developed at our institute. However, it is not finding proper use. At the fields they have been forced to use conventional pumps, and this is leading to a decrease of the service of equipment.

Does not the departmental approach, which was condemned long ago, tell here? And how is one to overcome these barriers? It seems that it is worth

permitting the institute to carry out in full the development of new designs of well pumps, which have successively proven themselves during the tests of prototypes and for which certificates of authorship have been received. Economic calculations also speak in favor of such an approach. In particular, it has been established that the organization of the production of pumps for wells showing sand and wells with a setting depth of 1,500 meters and more will make it possible to produce annually an additional 40,000 tons of petroleum. Such an argument is serving as a stimulus only for the designers of the institute, and by no means for those who should assume the basic role--the machine builders.

Our discussion began with the question of the reliability of equipment. Here, too, not everything is satisfactory. I will first touch on pumps. In recent times their so-called modernized models have appeared at the fields. It is worth looking at them more closely, at how a sense of amazement is emerging, in what direction the forces of designers and machine builders are being used. The assemblies and parts, which do not contribute to the increase of efficiency, but rather complicate use, since defects occur very often in these converted parts, prove to be modernized.

Apparently, a question immediately arose for the readers: But what did the institute do? It is always simpler to criticize from the side. I will try to respond and will dwell on what is hindering us. In the matter of ensuring the reliability of equipment its reconditioning and reuse are of great importance. Both the specifications for pumps repaired at the fields and the technology of repairs with a set of necessary tools and equipment were developed at the institute. The central workshop of the Azneft Association was organized on this basis. It is quite powerful: it annually reconditions 5,000 pumps.

It must also be said that the workshop is operating under difficult conditions. Among the main reasons are the shortage of spare parts and their incompleteness. The All-Union Association for the Repair of Petroleum Drilling Machinery is carrying out their supply. Unfortunately, very often the workers of the workshop are faced with such a situation, when they cannot match with the bushings plungers of the same size and vice versa. It is clear that they will not assemble reliable pumps. And at times it turns out: spare parts are available, but it is impossible to use them at the given moment.

When operating pumping wells the quality and assortment of sucker rods are extremely important.

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Institute of the Petroleum Industry and were hardened by high-frequency currents, the number of problems in the strings were reduced. However, it was not possible to completely eliminate them. A large number of sucker rods, which are still suitable for use, are being written off due to the lack of spare couplings, the output of which for the present has not been organized. The assortment of sucker rods is insufficient, as a result of which the petroleum- and gas-production administrations have been forced to make up strings which, in general, are irregular. Undoubtedly, this is leading to the decrease of the technical and economic indicators of deep-well pumping units. For wells with a large setting depth of the pump and forced withdrawals of fluid the institute developed and recommended for extensive introduction rods

made of steel, which have been hardened by high-frequency currents. However, their production is limited, which is upsetting the normal operation of these categories of wells.

In general, there are many problems. But the most urgent one of them is the overcoming of departmental isolation. Only the joint efforts of all the people, who are involved in the matter of increasing petroleum production in the republic, can ensure the solution of the problems facing the sector. The question of coordinating efforts is worrying all scientists and production workers. This is also spoken about in the draft of the new version of the CPSU Program. It seems to me that this should be spoken about in the draft as follows: "/Such forms of the organization of science, which ensure the interdisciplinary and intersectorial study of urgent problems, the necessary mobility of scientists, and the flexibility of the structure of scientific institutions, research and development, should undergo more extensive development./"

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SOCIO-POLITICAL FACTORS

SOCIOECONOMIC PROBLEMS OF SCIENTIFIC, TECHNICAL PROGRESS

Kishinev KOMMUNIST MOLDAVII in Russian No 9, Sep 85 pp 11-17

[Article by candidate of economic sciences O. Sorochan and G. Syrku, deputy chief of the Division of Labor and Wages of the Volna Production Association: "Socioeconomic Problems of Scientific and Technical Progress"]

[Text] The CPSU and the Soviet state are devoting particular attention to the utmost acceleration of scientific and technical progress--the basis of the improvement of social production, the increase of its efficiency, the steady increase of the well-being of the Soviet people, and the all-round development of the individual. Scientific and technical progress is an objective historical process of the forward movement of productive forces, which encompasses the interconnected development of science, technology, and production. Its concrete historical orientation, nature, and pace are determined by the dominant social, first of all socioeconomic, relations. It has a substantial influence on all spheres of social life: economics and politics, ideology, culture, everyday life.

The present stage of scientific and technical progress is characterized by a qualitatively new level of the development of productive forces. The use of new types and sources of energy (atomic, thermonuclear), the automation and cybernetization of production, the extensive use of computer technology, and the penetration of science into the microcosm (the study of elementary particles of matter) and the macrocosm (the development of space) are its most important features. The radical transformations of the productive forces are based on fundamental changes in the system of scientific knowledge and the increase of its role in social production. Along with the revolutionary change in all the components of social production radical changes are occurring both in the labor activity of people and in the spiritual life of society.

The modern scientific and technical revolution, being of a global nature, is encompassing the economically developed countries of both the capitalist and socialist economic systems. However, depending on the different socioeconomic relations it is assuming specific methods of implementation and has different socioeconomic consequences. Under capitalism the progress of science and technology is aimed at the further enrichment of the bourgeoisie, the polarization of the poor and rich strata of society, the strengthening of the

domination of the monopolies, and militarization. All this is being accompanied by the increase of the exploitation of the working masses, the growth of the army of "superfluous people," the devaluation of spiritual values, and the degradation of the individual. "...Capitalism," it is noted in the CPSU Program, "is paralyzing more and more the development of modern productive forces.... The production relations of capitalism are too narrow for the scientific and technical revolution. Only socialism can carry out this revolution and use its fruits in the interests of society." (Footnote 1) ("Programma KPSS" [The CPSU Program], Moscow, Politizdat, 1975, pp 27-28)

The unidirectionality of scientific and technical progress and the movement of socialist production is conducive to progressive changes of the productive forces for the good of all of society. Precisely the combination of the advantages of socialism with the achievements of the scientific and technical revolution is the basis for the functioning and improvement of the unified national economic complex of our country. Favorable opportunities for the development of scientific and technical progress are constantly being created in it. At the same time the practical need for its scientifically sound and purposeful acceleration is also increasing. For this the USSR State Planning Committee, the USSR State Committee for Science and Technology, and the USSR Academy of Sciences have formulated 170 scientific and technical goal programs, which are distinguished by a comprehensive approach to the development and assimilation of new equipment and by a broad social orientation. Their implementation is determining the socioeconomic development of the country during the 11th Five-Year Plan, as well as for the distant future.

The variety of scientific and technical progress is responsible for the diversity and multiplicity of the problems associated with it. They are connected with the increase of production efficiency and product quality, which requires the increase of the science intensiveness of production and the efficiency of scientific developments, the updating of equipment, the retooling and renovation of social production, and the introduction of advanced resource-saving technologies. In turn, this is solving the problems of the development of socialist labor into communist labor, the improvement of the socialist way of life, and others. Their successful accomplishment is connected with the most important directions of scientific and technical progress, namely: the automation of production, the most extensive use of computers and robots, the introduction of flexible machine systems, the further development of atomic energy and biotechnology, the obtaining of materials with preset properties, and complete mechanization which supplants unskilled manual labor.

At the present stage the accomplishment of the diverse socioeconomic tasks of our society is inseparable from the main direction of the development of the socialist economy--its changeover to the intensive path. "Only an intensive economy, which is developed on the latest scientific and technical basis, can serve as a reliable material base of the increase of the well-being of the working people, ensure the strengthening of the positions of the country on the international arena..." (Footnote 2) (M.S. Gorbachev, "The Lively Creativity of the People. Report at the All-Union Applied Science Conference," PRAVDA, 11 December 1984) it was noted at the All-Union Applied

Science Conference. The intensification of production presumes the further broadening and extension of "science--production" relations, which contribute to the transformation of science into an immediate productive force. The essence of this transformation consists in the achievement of the greater and greater science intensiveness of social production both by the improvement of the means of production and indirectly--through the development of the very generators, developers, and bearers of scientific ideas. Production, it was stressed at the 26th CPSU Congress, should be vitally interested in assimilating more rapidly and better the fruits of the labor of scientists and designers. At the same time science itself should also be a constant "disturber of the peace" and should not allow its stagnation and lagging. The close integration of science with production is giving rise to the natural tendency for the scientific potential of the country to increase. At present there are more than 1.4 million scientists in the USSR--this is a fourth of the scientists of the world. State spending on scientific research is constantly increasing. Thus, during the years of the 9th Five-Year Plan it came to 77 billion rubles, during the 10th Five-Year Plan--97.9 billion rubles, while during the 11th Five-Year Plan it will increase to 126 billion rubles. However, at present the growth rate of the expenditures on science is leading substantially the growth rate of the production volumes and the productivity of national labor. Such a situation requires the increase of the efficiency of scientific developments.

The making of themes urgent, the improvement of the methods and procedure of experiments, the improvement of information service, and the speeding up of the process of assimilating and introducing promising developments are the most important directions of the intensification of scientific research. The difficulties of the development of prototypes of new equipment, in particular, the need for the production of a large number of original parts in experimental production, the increase of the degree of risk, and the uncertainty of the results of pilot operations lengthen the science--production cycle. During the past five-year plan the average duration of the development of prototypes of new equipment in the sectors of the national economy came to 3-4 years. The latest technological processes are being assimilated even more slowly, for example, the replacement of old technology in the output of mass chemical products at times lasts 10-15 years. In the past decade changes have been noted in this area: whereas during 1971-1976 on the average in a year the production of 3,300 new types of industrial products was assimilated and series output was begun, during 1981-1983--3,600, that is, 9 percent more. However, the annual economic impact from the introduction of new equipment is less than the expenditures on its introduction (during 1971-1980 respectively 29.7 percent and 40 percent). In industry of the Moldavian SSR given the leading growth rate of the annual economic impact from the introduction of new equipment as compared with the growth rate of the actual expenditures on its introduction (in 1983 as against 1970 respectively 3.72- and 2.21-fold) the absolute annual predominance of the expenditures over the economic impact also still remains.

Along with the introduction of new equipment the acceleration of scientific and technical progress is also posing the task of updating the means of labor. "In case of the rapid development of the productive force," K. Marx stressed, "all old machines should be replaced by more profitable ones, that is, should

be completely discarded" (K. Marx and F. Engels, "Soch." [Works], Vol 25, Part II, pp 342-343). The need for the replacement of equipment is due to not only its wearing out, but also its obsolescence. Not only the equipment being used, but also the equipment being produced can be economically obsolete and liable to replacement. This creates the need to halt as soon as possible the output of equipment and instruments, which do not provide the corresponding level of production efficiency. At present the process of replacing equipment is proceeding extremely slowly, for the country as a whole on the average in a year 3 percent of it is replaced. Machines and devices, which were produced 15-20 years ago, continue to operate at enterprises of the country. In our republic, for example, the metal-cutting equipment, which has been used more than 10 years, amounts to about 40 percent. The aging of machine tools and equipment is accompanied by large expenditures on capital repair and spare parts. The expenditures frequently exceed the price of new, even more productive equipment. The "pulling up" of lagging sections needs the significant increase of the pace of machine building, the increase of the reliability and durability of machines and equipment, the shortening of the time of the construction and assimilation of rated capacities, and the creation of flexible robotized systems. The measures on the replacement of means of labor should "blend" with the long-term strategy of scientific and technical progress, which encompasses all the aspects of the development of the material and technical base of production. Here it is important to formulate such a set of organizational, economic, and moral measures, it was emphasized at the June (1983) CPSU Central Committee Plenum, which would interest managers, workers, scientists, and designers in the replacement of equipment and would make work in the old way unprofitable. During the 11th Five-Year Plan it was planned to speed up the rate of the replacement of equipment in the national economy by approximately 1.5-fold and to assimilate the production of about 19,000 descriptions of new types of machines, equipment, instruments, and materials. The retooling and renovation of the national economy on the basis of the mass introduction of advanced technological processes and completely mechanized and automated systems of machines are the most important direction of technical policy in the 1980's, which corresponds to the intensification of social production. The accomplishment of these tasks will contribute to the improvement of product quality and the increase of the productivity of national labor.

Today the social importance of the modernization of equipment is also increasing more and more. This is appearing clearly in the increasing ergonometic demands on it, namely in eliminating excessive noise and vibration, reducing the burden and monotony of labor--in "humanizing" machines. The consideration of these requirements is the most important prerequisite of the improvement of the conditions of labor activity, the creation of production comfort, and the creative display of the individual.

Radical changes in production technology, which are contributing to the increase of its intensification and efficiency, are being achieved under the influence of scientific and technical progress. A promising direction of the improvement of technology consists in the development and introduction of processes with few operations, low-waste and waste-free processes, which contribute to the complete use of raw materials and materials, as well as the more complete extraction of the useful components from mined minerals, the

decrease and combining of technological operations, and the development of energy- and resource-saving technologies. Here the maximum conservation of the environment should be ensured. The base for the further improvement of production is being expanded from year to year. Thus, the increase of the output of forge and press equipment by 13 percent, NC machine tools and robotized press complexes by 1.3- to 1.5-fold, computer control complexes based on miniprocessors for the automation of machines, equipment, and instruments by 57 percent is envisaged in the State Plan of USSR Economic and Social Development for 1985. New technology, by transforming labor activity, affords extensive opportunities for the integral, harmonious development of the personality of the worker, which presumes a high level of the vocational training, education, and general culture of each person. At present man is frequently the most "weak link" in new technological processes. Therefore, the development of scientific and technical progress and the implementation of its achievements are impracticable without the all-round harmonious development of the worker himself. The particular urgency of this situation received legislative reflection in the reform of the general educational and vocational school.

The interconnection of the social and economic problems being solved in society also appears clearly in the program of scientific and technical progress in the agroindustrial complex of the country. This long-range program, which is oriented toward the solution of the food problems, envisages with allowance made for regional peculiarities the reliable scientific and technical support of all the units of the agroindustrial complex, the improvement of the mechanism of their interconnection, and the improvement of the material and technical base of the sectors belonging to it. For example, the creation of a systematically organized technical base of farming, which ensures not simply the quantitative increase of the machines and mechanisms, which are already available in this sector, but also the formation of integrated systems of them, is being planned. It is a question of the use in farming not of individual machines, but of complete technical and economic systems which ensure the completed mechanization of production. The technical base of the agroindustrial complex of Moldavia already includes a specialized system of machines for the complete mechanization of labor-consuming processes in grape growing, vegetable growing, horticulture, tobacco growing, and other subcomplexes.

The questions of the retooling of the sectors of the processing industry and the improvement of the transportation and procurement network and trade hold a special place in the program of scientific and technical progress in the agroindustrial complex. The development and introduction of new technologies of the processing and storage of agriculture products are grouped with the priority directions of scientific and technical progress. In the agroindustrial complex of Moldavia, in particular, the method of the aseptic canning of prepared fruits and vegetables will be introduced. During 1981-1985 the production of food products by the method of freeze drying will increase by twelvefold. The storage of fruits with the use of refrigeration, a gaseous atmosphere, and automated temperature conditions will be increased in 1985 to 84,400 tons. In the same year the storage of potatoes and vegetables by the method of forced ventilation with natural cooling and refrigeration will be increased to 38,600 tons. Thus, the introduction of new

technical means of labor and production technologies in the subdivisions of the agroindustrial complex is promoting the increase of the degree of mechanization of production processes, the improvement of the use of the available production potential and raw materials, the decrease of the losses of products at all stages of the technological cycle from the field to the consumer, the improvement of the quality and the enlargement of the assortments of the food products being produced. At the same time the conditions are being created for the convergence of the two forms of property, the transformation of agricultural labor into a version of industrial labor, the change of living conditions of the countryside, and the improvement of the way of life of millions of workers.

The acceleration of the pace of scientific and technical progress in the 1980's and the future is also dictated by other factors of economic growth. In particular, the problem of manpower resources is becoming urgent. The high level of employment of the able-bodied population in the national economy (with allowance made for those who are studying with leave from work, it comes to 94 percent) and the substantial decrease of its growth (to 3.8 percent in the 1980's as against 18 percent in the 1970's) are increasing the importance of the efficient and effective use of the manpower potential of the country.

The increase of the labor efficiency of the gainfully employed population on the basis of the use of the achievements of science and technology is becoming a decisive prerequisite of the further development of social production and the solution of social problems. This is clearly confirmed by the following figures: during the 11th Five-Year Plan approximately 90 percent of the increase of the national income and industrial production of the country was provided by means of the increase of labor productivity and only 10 percent was provided by means of the increase of the number of workers. In Moldavia the proportion of the intensive factors of growth is significantly less: during the current five-year plan it is planned to provide 60 percent of the increase of industrial production by means of the increase of labor productivity. At the leading enterprises of the republic this indicator is higher, for example, at the Volna Production Association in 1983 it came to 93.4 percent.

In the efficient use of manpower resources a primary place belongs to the further development of scientific and technical progress. A significant saving of labor at many enterprises is being achieved precisely on the basis of the increase of the technical level of production. Thus, at the Volna Production Association the number of conditionally freed workers is constantly increasing: in 1984 as compared with 1981 it came to 165.8 percent. As a whole in industry of the country owing to the introduction in production of new equipment, including minicomputers, microcomputers, and automated control systems, during 1971-1983 the labor of more than 550,000 people was saved annually. In 1985 it is planned to free conditionally about 800,000 workers, including 73,300 in the Moldavian SSR.

The decrease of manual unskilled labor is a most important direction of scientific and technical progress, which contributes to the optimization of the structure of employment, the elimination in a number of cases of the shortage of manpower, and the creation of favorable conditions for labor

activity. The solution of this problem is accompanied by a number of difficulties. First of all the number of workers engaged in manual labor is still significant (35 percent of the total number of people employed in the national economy of the country, and for some sectors 50-60 percent, in auxiliary production up to 80 percent). Further, technical decisions on the mechanization of unskilled labor are lacking in a number of cases (most often in auxiliary production). The equipment being produced is often intended for incomplete mechanization (with the preservation of about 50 percent of the manual operations). This entails the need to carry out the secondary mechanization or further mechanization of production processes, which involve both additional investments and the new expenditure of time. The set of national economic measures for the 1980's envisages a substantial decrease of the workplaces of unskilled and semiskilled difficult manual labor. In USSR industry alone in 1985 it is planned to transfer from manual to mechanized labor approximately 400,000 workers.

In Moldavia in connection with the specific nature of socioeconomic development (the large proportion of light and the food industry and agriculture in the structure of the national economy) the level of employment in manual labor is higher than the all-union level. In republic industry alone 95,000 people are engaged in it. Therefore, the extensive implementation of measures on the introduction of the mechanization and automation of production is becoming a most important direction of technical progress at each enterprise. In particular, at the Volna Production Association during 1980-1983 the number of workers engaged in manual labor in the total number decreased from 40.3 to 34.9 percent.

The noted processes are a component of the program on the transformation of labor, which was adopted by the 26th party congress. It is well known that the labor sphere is the most important sphere of the formation and development of the individual and of the display of the intellectual and physical capabilities of man. Mature socialist society on the basis of the achievements of the scientific and technical revolution is posing the task of the improvement of working conditions, the elimination of monotonous, unappealing, unattractive jobs, the enrichment of the content and the increase of the creative nature of labor, and its conversion into the very first vital need of man. And here the role of scientific and technical progress is invaluable. Precisely the transition to the stage of complete automation is giving rise to the objective need to remove man from the framework of immediate production and to replace him with automatically operating technological processes. Thus, the conditions are being created, under which "labor acts no longer so much as labor, which has been included in the production process, as such labor, in case of which man, on the contrary, treats the very process of production as its controller and regulator.... Instead of being the main agent of the production process, the worker stands next to it" (K. Marx and F. Engels, "Soch.," Vol 46, Part II, p 213).

The development of the technical basis of production, which leads to the transfer of functions from man to means of labor, does not signify the impoverishment of the content of labor and the decrease of the role of man in production. On the contrary, new, more meaningful labor functions, which are

connected with the designing and engineering of equipment, the general control of production, and its improvement, appear with the transfer of executive functions from man to machine. Thus, the labor of man, being transferred from the sphere of the functioning of productive forces to the sphere of their development, will appear more and more in the form of scientific, engineering, and technical activity, which, in the words of K. Marx, "controls all the forces of nature." Such activity exalts the role of man in social production and presumes his all-round development in all spheres of vital activity.

The extensive, rapid realization of the possibilities, which stem from the fundamental combination of the advantages of the socialist system of management with the achievements of science and technology, needs the intensification of scientific developments and the improvement of the practical forms of the introduction of scientific and technical progress. "In posing the task of speeding up socioeconomic development, the Central Committee has in mind not simply the increase of the growth rate of the national economy," General Secretary of the CPSU Central Committee Comrade M.S. Gorbachev noted at the conference in the CPSU Central Committee on questions of the acceleration of scientific and technical progress. "It is a question of a new quality of our development, rapid progress in the strategically important directions, the structural reorganization of production, the changeover to the intensive path and effective forms of management, and the more complete solution of social problems." Under the conditions of mature socialism the development of scientific and technical progress serves the building of the material and technical base of the new society and promotes the development of socialist relations into communist relations, the formation of the conditions of communist labor, and the harmonious development of all members of society.

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SOCIO-POLITICAL FACTORS

INTERCONNECTION OF DEVELOPMENT OF SCIENCE, SOCIETY

Moscow PRAVDA in Russian 12 Oct 85 p 3

[Interview with Corresponding Member of the USSR Academy of Sciences Ivan Timofeyevich Frolov, chairman of the Scientific Council attached to the Presidium of the USSR Academy of Sciences for Philosophical and Social Problems of Science and Technology, by PRAVDA correspondent V. Mudragey: "Human Measurement"; date and place not given; first paragraph is PRAVDA introduction]

[Text] How does science "work," what moves it ahead, what place does it hold in the system of culture and human activity, what kind of science do we need? These questions were at the center of the interview of a PRAVDA correspondent with Corresponding Member of the USSR Academy of Sciences I. Frolov, chairman of the Scientific Council attached to the Presidium of the USSR Academy of Sciences for Philosophical and Social Problems of Science and Technology.

[Answer] "The opinion still exists," Ivan Timofeyevich said, "that with the aid of science alone it is possible to solve all problems. At the same time they also speak about what is called the 'demon' of science. So what is it--good or evil?

"The answer in many ways is governed by the sociophilosophical approach, the nature of the social system, within which scientific achievements are used. A new type of science, which is turning more and more actively directly toward man and is being closely linked with practice, social ethical norms, and culture, is now forming. It is being realized more and more clearly that it is necessary to find a human measurement of scientific and technical progress and that science should be more closely connected with human values. In essence it is a question of the social mechanisms of the uniting of science and production (including economic and spiritual stimuli, the interrelations of people with each other, intrafamily relations, and others), the development of man himself, his consciousness and culture, moral qualities, and, finally, the forms and character of his relations with nature, the ecological parameters of society and man in their interaction.

"Such an extensive group of problems, which constitute the social and humanistic potential of science, follow from the Marxist-Leninist

understanding of it as a complex system which is connected by thousands of threads with the life of society and man.

"It is impossible, of course, to say that in itself the scientific search for the truth, for example, in the natural sciences and technology, is governed only by this circumstance. But the point is that our view of science takes it far beyond the framework of 'pure' research. Modern science is influencing more and more all aspects of social relations, turning into a mighty social force. Culture, the means of mass communications, international relations, and man himself with his natural biological and sociocultural characteristics have been included in its orbit. But science not only interacts with all spheres of human existence. It also depends substantially itself on social and human factors. And, it seems, the reserves of the acceleration of scientific and technical progress are contained precisely here."

[Question] "The tasks of scientific and technical progress are now regarded as the initial ones for the solution of the entire spectrum of problems of the development of society. Moreover, priority importance is being attached to basic science. Precisely it acts as the generator of ideas, makes breakthroughs into unknown areas, and provides outlets to a new level of efficiency. What, in your opinion, is the nature of the interrelationship of the basic sciences and applied research?"

[Answer] "The achievements of technical progress, which are connected with microelectronics, information science, robotics, and biotechnology, are a direct result of the successes of the basic sciences. However, these sciences have not only an applied, but also an absolute value, by satisfying the spiritual needs of man and being united here with literature and art. Their cultural and human significance is the most important component of the potential of science as a whole.

"Unfortunately, the underestimation of the basic sciences and even their opposition to the applied sciences exist at times. Such an approach is frequently also carried over to philosophy: it is divided into disciplines which are more or less 'responsible to practice.' As paradoxical as it may be, as a result of such a 'division' the field of knowledge, which it is customary to call the philosophy of science, particularly natural science, ends up in the 'less responsible ones.'

"Meanwhile experience shows: the elaboration of major problems of the knowledge of the laws of nature, society, and human thinking promotes to the greatest extent the accomplishment of urgent practical tasks. Such was the case, in particular, during the development of quantum mechanics and the theory of relativity, cybernetics, and now molecular genetics, genetic engineering, and others. Moreover, precisely during the periods of the formation of new basic sciences and generalizations and the revolutionary breakup of established theoretical conceptions philosophical research, which leads to the enrichment of science itself with the only true methodology of knowledge and philosophy--dialectical materialism--played its heuristic, that is, trailblazing role."

[Question] "The task of increasing sharply the role and responsibility of academic institutes for the development of the theoretical principles of fundamentally new equipment and technology is now arising. On the other hand, it is also necessary to make the economy most receptive to scientific and technical progress. This presumes the reorganization of a number of units of planning and management. But such reorganization also concerns science itself--both academic and sectorial."

[Answer] "With reference to social research and the human sciences it is possible to settle these questions, by performing work on complex problems and programs and using such a good organizational form as the scientific councils. This makes it possible jointly with academic and sectorial research institutes, and without duplicating them, to strengthen the relations with science of higher educational institutions and practice and to ensure the real interaction and integration of the sciences and interdisciplinary research on fundamental problems. It is necessary merely to orient these councils actually toward complex problems and programs, which, however, is not the general rule both in the system of the USSR Academy of Sciences and in science of higher educational institutions. The management of the scientific councils should, in my opinion, hold a special place, in particular, in the activity of the Presidium of the USSR Academy of Sciences.

"It is characteristic that the question of new forms of the organization, planning, and management of scientific and technical progress is also being raised more and more specifically within the framework of the entire socialist community. It is a question of the elaboration of joint collective forms of management, which unite the scientific, technical, and production potentials of the interested socialist countries."

[Question] "The human factor is the decisive factor of all changes. The problem of the occupational and cultural development of man, creative labor and initiative, conscious discipline and morality has been posed today both as the goal of socialist society and as a condition of its achievement of a new level. What is the role of science here?"

[Answer] "A new turn to the problem of man, his comprehensive study and development, his future, apparently, would be timely. This is now the most urgent global problem, a kind of reference point.

"The importance of the human factor in general, and in the acceleration of technical progress in particular, is clearly realized both by practice and by science. It is a matter of organizing truly scientific, comprehensive studies of man in close connection with the objective effect of the social conditions of our society and with the diverse and ramified educational activity of the Communist Party and the Soviet state.

"Man in his aggregate is the aggregate of all social relations. This well-known thesis of K. Marx is the basis both for modern research and for practical work. The change of such an aggregate requires, however, a thorough analysis, which takes into account the human aspects of new social factors, which have acquired paramount importance. This concerns the forms and methods of the management of the labor and social activity of people, the coordination

of public, collective, and personal interests, the creation of the optimum social and organizational conditions, the improvement of the system of stimuli, and the increase of the initiative of people, their discipline and good organization. Finally, the moral criteria of life and activity, their meaning, which is taken not only in generalized form, but also in the exclusively personal, individualized aspects."

[Question] "And what is it proposed to do for this?"

[Answer] "First of all the more thorough study of the problems of communist education--especially of the rising generation, the processes of the formation of the world outlook and morality, the forms and methods of combating the still existing antisocial, amoral phenomena is necessary. It is necessary to study the interaction between the social and natural biological (genetic, psychophysiological, ecological, and so forth) factors of the vital activity of man and, accordingly, to organize better medical genetic, ecological, and demographic education and training, the psychological adaptation and training of people, in particular, in their interrelations with new equipment. There are many problems, a number of them, apparently, should have been solved yesterday. Therefore, the acceleration and the more intensive development of the sciences on man--both the social and the natural and technical--are also required. But for the present the thorough scientific knowledge of man is not being ensured in our country in a proper theoretical and scientific organizational manner.

"There is not a single center, which would take upon itself the accomplishment of the posed task and from which it would be possible to obtain the corresponding recommendations for the practice of communist education. If we turn to our comparatively recent history, it is possible to recall the noteworthy initiative of A.M. Gorkiy, who proposed back in the 1930's to establish an Institute of Man, which should have become, according to the idea of the writer, the embodiment of the union of science, art, and labor. During those years this idea was not implemented. But the need for its implementation is all the more urgent today.

"Such an institute could be at first a small organization which unites more or less 'broad' specialist-philosophers and other scientists--social scientists, as well as natural scientists who are studying man. The structure and functioning of this institute presume, however, as the basic form of scientific activity the enlistment of 'narrow' specialists who should not be diverted from the experimental base of their own organizations (genetic, biomedical, and others) for the fulfillment of comprehensive programs and projects on a contractual basis.

"Here the USSR Academy of Sciences, the USSR Academy of Medical Sciences and the USSR Academy of Pedagogical Sciences, the USSR Ministry of Culture could become the 'interested parties.'

"The latter, in my opinion, is necessary because in the future the Institute of Man should be fundamentally supplemented in accordance with a drafted special plan by a new scientific propaganda and educational organization--the Museum of Man. The history of the human race and the current knowledge of man

as a biosocial being, his civilization, culture, wisdom, and humaneness, his struggle for his own liberation and the prospects in the future would be revealed at it by the means of science and art.

"In such a combination--the Institute of Man and the Museum of Man--it is possible, apparently, actually to realize the scientific, educational, training, propaganda, and counterpropaganda functions of anthropology as a unified science. The educational purpose of such a unified center, which is directed to a significant degree toward young people who are entering life, should be especially emphasized.

"It may seem to some people that what I am speaking about is an anticipation or even simply a utopia. Of course, there are many other, undoubtedly, vital and especially urgent problems and tasks. But, after all, the broached question--at least in its scientific and ideological sound--determines to a significant degree the 'nature' of socialism, and we cannot do without the search for new forms and methods of its solution. For many means of solving in various directions and in various forms the problem of man, his study and development, and his future as the main, basic problem of socialism are emerging already now. There are many scientists and propagandists, figures of culture and art, who to one degree or another are engaged in it. And my idea reduces to uniting them and concentrating forces on one idea and its implementation, which, undoubtedly, is a stage-by-stage and very lengthy process. But it is necessary already now to set to work."

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REGIONAL ISSUES

DEVELOPMENT OF ARMENIAN INDUSTRY ON BASIS OF S&T PROGRESS

Moscow PRAVDA in Russian 12 Sep 85 p 2

[Article by PRAVDA special correspondents Yu. Arakelyan and G. Ovcharenko (Yerevan-Moscow): "The Gradients of Growth"; first four paragraphs are PRAVDA introduction]

[Text] When the meetings at the plants and institutes, in the party organizations and departments of the republic were over, and our notebooks swelled with all kinds of figures, information, and facts, it was necessary to draw conclusions. They coincided in general with the opinion of the authoritative commission which, so it happened, literally a few weeks before us had checked up on how the workers of the Armenian SSR were fulfilling the socialist obligations. In its filed report it was recorded: by and large industry of the republic is developing at a rate which exceeds the assignments of the 11th Five-Year Plan, the obligations, which were published in PRAVDA at the beginning of the year, are being fulfilled.

But something prevented us from dipping our pen in rose-colored ink and settling down to an ode of many lines. We once again looked over our notes--and suddenly the trip to Lake Sevan came back. There, in the high mountains, our ears hurt, as if we had gotten out not of a vehicle, but of an airplane after a flight of many hours.

"A difference of altitudes," the driver Zaven explained, having pointed to the needle of the altimeter--it had gone from 1,000 meters to the 2,000-meter mark.

Such differences also exist in the results of the competition which is aimed at the intensification of social production by means of the acceleration of scientific and technical progress. For example, the gaps between the leading and lagging collectives, the availability of reserves and their use, the external satisfactoriness of the technical and economic development by the open gaps?

During the first half of the year 9 percent of all the industrial enterprises of the republic did not fulfill the plan on the sale of products, while

17.1 percent did not fulfill the plan on the increase of labor productivity. As a rule, these are the collectives which inevitably round out the table of the participants in the competition. For a long time the Zakavkazkabel Association was also among them. Its managers, without hesitating, named a large number of reasons for such a situation. There were allusions here both to related works, which were letting them down, and to the fact that unrealistic assignments were being given, the equipment is poor, and so on.

But then they appointed here as general director Genrikh Babkenovich Badeyan. Without going to the office, he went about the shops of the main plant in Yerevan. He looked, wrote something down in a notebook, frowned. But he said nothing. He did not contain himself only in the metallurgical department, where rolling mill operators Amayak Botoyan and Mnatsakan Usikyan were operating drawing mills, while standing almost up to their knees in scraps of wires.

"Listen here, is it pleasant for yourselves to work in such a mess?" he asked.

The people he was talking to did not have to search for an answer. They immediately revealed everything about the milling machine, which breaks the wire more than it draws it, and about the organization of labor, when it is necessary to work less and to be idle more. And also about the wage, which sometimes it is shameful to show the wife. So that if the chief does not like them, their resignation has already been written, it is in their working clothes.

"Let us agree as follows," Badeyan said. "I am doing everything that depends on me, but you do the same thing. Then we will decide who is to leave: you or I...."

Today the milling machine operators and the general director are friends, allies. Of course, it was not possible to do immediately everything that was planned. But the people understood that the new director is not waiting until changes for the better come from outside, but is striving for them himself.

First of all the numerous shops and sections were united into three basic works with a practically closed technological cycle: the metallurgical works, the rubber insulation works, and the works of wound wires and cables. This immediately made it possible without additional assets to use more efficiently the available capacities, to decrease the losses at the former junctions, to identify the bottlenecks at each works, and to purposefully eliminate them. In less than 2 years at the main Yerevankabel Plant they replaced a third of the equipment and put the premises in order. There were enough forces and time even to lay out flower gardens and fountains on the grounds of the plant. Since last year the Zakavkazkabel Association has stably fulfilled all the technical and economic indicators. And what is important: the policy, which was adopted by the new director, was eagerly endorsed by the majority of the collective. The turnover of personnel as compared with the beginning of the five-year plan has decreased from 25 to 9 percent.

Does it turn out that the problem of laggards is the problem of capable, energetic managers, who know how to organize production? To a significant

extent, yes. For there are so many cases, when an insufficiently competent chief of a section or plant for years sits in his chair, and they remove him only after he has completely wrecked the work of the collective.

It also happens in a different way. For a long time they held the Machine Building Plant imeni Dzerzhinskiy up as an example. It fulfills the plan, there are no irregularities in production. But then A. Sarkisyan came here as director. And something incomprehensible at first glance occurred: in half a year they began not to praise, but to curse the enterprise. The production indicators began to creep downward. In the Ministry of the Machine Tool and Tool Building Industry they took alarm: How is it possible in such a time to ruin so one of the best enterprises of the sector?! However, the new manager was able to prove that previously, blinded by the magic of figures, here they took black for white. The point is that the plant workers...since 1944 had produced the same machine tool. An obsolete one, which hardly anyone needs. Then they began to make tool cabinets. Cumbersome, awkward ones. But for the plant they were a rescue pole: they pursued the easily produced cabinet and other similar consumer goods in large series--up to 38 percent of the total production volume. Incidentally, 1,000 tons of scarce steel sheet were used for them annually. But the external satisfactoriness resulted from this: with respect to the gross the plant came out among the leaders.

Sarkisyan set a goal: to begin the production of a modern center lathe. And, in spite of the difficult financial situation of the plant, the crowdedness of the premises, and other obstacles, the collective coped with this intensive task. A month ago the honorable Emblem of Quality was awarded to the new item of the Yerevan workers. One of the models of the lathe is equipped with numerical control. The development of flexible automated metal-machining centers is next.

However, we will not hurry with the conclusion that at the machine tool building plant everything is in order. This year, it is true, the collective is fulfilling the plan. This reassured some people in the Ministry of the Machine Tool and Tool Building Industry and in the republic: What else, they say, is necessary? But the collective of the enterprise, which is getting on its feet, needs much. First of all it is necessary to expand the assembly shop, for which new equipment has already been purchased. Then it is possible to increase sharply the output of the lathe, for which clients are already today standing in line. Alas, for the 12th Five-Year Plan not a ruble was allocated to the Plant imeni Dzerzhinskiy for the renovation of production. Moreover, the State Bank is taking all the receipts for its account for the repayment of former debts.

The collective of the Charentsavan Armatvo Association also found itself in a difficult situation. It is assimilating the production of a new small-tonnage carburetor forklift truck. Executives of the republic demanded of the Ministry of the Automotive Industry guarantees that the new machine would satisfy the most modern requirements. They proposed to produce several other versions: diesel-electric forklift trucks and forklift trucks with cable power supply. The Ministry of the Automotive Industry gave assurances that the forklift truck would not be worse than foreign models. But when the matter came with great difficulties to production, M. Gritsishin, deputy chief

of the Lvov Main Special Design Bureau, suddenly announced that the new design of the forklift truck...is inefficient. Now steps are urgently being taken to bring its motor up to condition, but the machine, which the Armenian machine builders would like to supply to the national economy, will not be received in the next few years.

It is well known: the changeover to new, advanced items involves first of all the retooling of production itself. In the Armenian SSR much has already been done on this level. But obviously less than is required. First of all because there is a certain gap between sectorial science and production. Take the same Zakavkazkabel Association. In many ways due to poor technical equipment the Ministry of the Electrical Equipment Industry is not entrusting to it the assimilation of new, competitive items. But a department of the All-Union Scientific Research Institute of the Cable Industry is located here, in Yerevan. With what has it helped the production workers? With practically nothing.

"We specialize in other types of products," G. Kazanchyan, director of the department, explains.

Well, is it not a paradox: nearby there are several cable plants, but Yerevan scientists go to introduce their developments...to the Far East.

"We have been posing for a long time the question that the Yerevan Department of the All-Union Scientific Research Institute of the Cable Industry be merged with our association," G. Badeyan says. "Our ministry and the institute are alone. The advantages here are obvious, but for the present there is not even a decision to reorient the work of the department toward our themes."

Meanwhile positive experience of the cooperation of science with production exists in Armenia. The All-Union Scientific Research Institute of Complex Electrical Equipment became a part of the Armelektromash Production Association. At the institute they immediately carried out structural reorganization: they set up departments in the main directions of the association. And the results were not long in coming: in 15 years of joint work the introduction of new equipment at the plants of the association was sped up sharply, new items appeared in production. Their updating is taking place constantly, just as is the retooling of production.

Although a gap, which they see well both at the institute and at the association, remains here as well. The point is that today the plant is not responsible for the indicators of the institute, while the scientists do not bear responsibility for the results of the work of the production workers.

"We need a unified plan and unified responsibility," both believe. "For the present our cooperation in many ways is formal, and this does not do the matter good."

They are also of the same opinion in the republic Council of Ministers. Deputy Chairman of the Council of Ministers Yu. Khodzhamiryan believes that the time has come to unite the plants and institutes of the same sector into scientific production associations. Then the work on the acceleration of

scientific and technical progress will have a finished form. Thus, scientists conduct applied research work, the specialists of the experimental design bureau develop the technology. At the pilot plant, when producing small series of new types of products, they will bring their production up to the necessary parameters, while the basic plants will begin the series production. On the average it is 2-3 years.

Today in the republic they are already shifting from words to deed. And it is possible to hope that the first scientific production associations, the ones about which Yuriy Yervandovich is speaking, will appear in Armenia already at the beginning of the next five-year plan.

But thinking people are already coming with a new proposal.

"More than 40 plants and institutes, which are subordinate to 8 all-union industrial associations of the Ministry of the Electrical Equipment Industry, operate in our region," P. Manvelyan, general director of the Armelektromash Production Association, says. "The practical production relation between them and the ministry is extremely complex. The situation is also similar in other sectors. So why not set up territorial sectorial complexes with direct subordination to the ministries? In this case on the scale of the region it is possible to pursue more effectively a purposeful scientific and technical policy and to shift freely manpower, material, and technical resources."

This proposal was suggested by life itself. The isolation of the subdivisions of even one department has already set teeth on edge. The suggested solution is an effective means for its elimination. But, unfortunately, the republic is not authorized to settle this question.

Industry of the Armenian SSR today is on the rise. And this stems first of all from the fact that here they are engaged in earnest in scientific and technical progress. This is a fact. But it is also obvious that there are still many reserves for the further improvement of the matter. And it is necessary to use them to full effect.

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REGIONAL ISSUES

USE OF SCIENTIFIC POTENTIAL OF BELORUSSIAN HIGHER SCHOOL

Minsk SOVETSKAYA BELORUSSIYA in Russian 25 Sep 85 p 2

[Article by B. Kaledin, chief of the Science Administration of the Belorussian SSR Ministry of Higher and Secondary Specialized Education: "'We Can' Means We Are Obliged"]

[Text] It is by no means easy to evaluate the development of science, including the science of higher educational institutions. In recent years the collectives of science teachers of the higher school of the republic seem to have been working rather well: the amount of research increased appreciably, the proportion of the most important themes reached 80 percent, the number of received patents increased by more than threefold as compared with the 10th Five-Year Plan, the number of developments introduced in the national economy increased by 1.5-fold. So the successes are obvious. But this is only from the standpoint of yesterday, with which they also usually compare the present level. However, such criteria of evaluation, it seems, are far from completely valid. The tasks on the acceleration of scientific and technical progress, which have been posed by the party, dictate the necessity of a different approach. The comparison of the end results of research with the potentials of scientific collectives, particularly the collectives of higher educational institutions, in my opinion, should become the main thing.

But the potentials attest that scientists could have done much more. The costs are great because dispersal, work on many themes, and the conducting of frequently secondary research have not been eliminated. At several higher educational institutions the demandingness on the effectiveness of scientific research has been relaxed, the quality and the timely completion of the stages of the research being conducted are being poorly monitored. The collective of the Belorussian Institute of the National Economy, for example, has noticeably given up ground. Here such indicators as the economic impact and the yield per ruble of expenditures have declined in recent years. The level of research and its effectiveness have to be increased significantly at the Mogilev Technological Institute. The fact that a large percentage of the submitted applications for inventions are rejected due to the lack of novelty, for example, attests to the low quality of a number of developments being conducted here.

Serious complaints should be lodged against the higher educational institutions which are not subordinate to the Belorussian SSR Ministry of Higher and Secondary Specialized Education. Their share in the most important indicators of science of higher educational institutions (the number of inventions, the amount of research, the number of introduced developments, and the economic impact) comes to only 10-20 percent. In particular, scientific research work is not being performed efficiently enough at such large technical higher educational institutions as the Institute of the Mechanization of Agriculture (BIMSKh) and the Institute of Railway Transportation Engineers (BIIZhT), the science teachers of the Belorussian Agricultural Academy, it seems, can provide a significantly greater output. A significant economic impact from the use of developments is being planned for the Belorussian SSR Ministry of Higher and Secondary Specialized Education. Such an indicator is not being reported to the institutes of other ministries and departments, hence, there is also no orientation toward it in the collectives. Is this not one of the reasons for the lower scientific yield of these higher educational institutions?

It is no secret that a quite significant portion of the instructors of higher educational institutions are poorly participating in research and at times do not provide a new scientific product for years. At some higher educational institutions and in some scientific collectives research is being conducted at an insufficiently high level, according to obsolete methods, without the extensive use of the planning and automation of experiments, computer technology, network schedules, and so on.

The Belorussian SSR Ministry of Higher and Secondary Specialized Education now regards as the main thing in the system of the management of science the acceleration of the pace of research and the rapid and extensive introduction of scientific and technical achievements in practice. We are basing ourselves on the fact that no other achievements of the science of higher educational institutions, the fame and prestige of its representatives can replace the specific, appreciable material results of scientific research. Therefore, we are seeking and improving the forms of contact with production and are drafting joint plans with sectors, including the USSR Ministry of the Communications Industry, the USSR Ministry of the Chemical Industry, the USSR Ministry of the Electronics Industry, the USSR Ministry of Mineral Fertilizer Production, the Belorussian SSR Ministry of Local Industry, the Belorussian SSR Ministry of Light Industry, the USSR and Belorussian SSR State Committees for Construction Affairs, and other ministries and departments.

Here the basic attention is being devoted to the development of advanced materials, energy- and material-saving technologies, means of automation, automatic manipulators and robots, mineral fertilizers, biotechnology, and the technology of storing agricultural products. There is a considerable reserve in this work. For example, V.A. Grinberg and V.I. Tutov, scientists of the Belorussian Polytechnical Institute, were awarded the 1985 Prize of the USSR Council of Ministers for the development of the technology and the devising and introduction in production of new equipment for founding. S.S. Shushkevich, Ye.Ya. Furs, V.N. Lunev, and B.Ye. Kulikovskikh, staff members of the Belorussian State University, were awarded the same prize for the introduction of highly efficient small spectrometers.

Science of the higher educational institution is now offering industry a number of other effective developments. In particular, the technology of producing agglomerated phosphogypsum from the waste products of the Gomel Chemical Plant imeni 50-letiya SSSR for the cement industry and the technology of obtaining high-strength facing items made from gypsum await introduction. Both are proposals of scientists of the Belorussian Polytechnical Institute.

The method of obtaining new materials with a filler from the waste products of the same Gomel Chemical Plant, which was developed by the Belorussian Technological Institute, promises many advantages. It seems that the Belarusrezinotekhnika Production Association should set up the production of these materials.

The organization of a section for the production of a new material (the development of the Belorussian Technological Institute) at the Minsk Porcelain Plant can yield impacts in the millions of rubles and the solution of difficult technical problems. Unfortunately, the Belorussian SSR Ministry of the Construction Materials Industry is not displaying proper activeness in the implementation of these proposals. We have the proposals of the Minsk Institute of Radio Engineering on the extensive assimilation of televisions. In short, the file of proposals for introduction is considerable. It is up to the enterprises and ministries.

Another most serious problem is the increase of the efficiency of patent and inventing activity. Far from all technical innovations are protected by certificates of authorship. Comparatively few of the inventions of higher educational institutions are being introduced in the national economy (less than a third) and are being patented abroad. We have sold few licenses, although the interest of foreign firms in the developments of higher educational institutions is becoming more and more active. Much work still lies ahead here, especially for such higher educational institutions as the Belorussian State University, the Minsk Institute of Radio Engineering, the Belorussian Technological Institute, and the Belorussian Polytechnical Institute.

The contribution of science of higher educational institutions to the acceleration of scientific and technical progress could have been significantly greater, if it had been possible to solve a number of other urgent problems. Thus, the sharp increase of the amount of scientific research at the higher school is coming up against the limitation of the wage fund and the number of workers of science and scientific service. Higher educational institutions need the assistance of the State Committee for Science and Technology, the Belorussian SSR State Planning Committee, ministries, and departments.

From all points of view, including in the interests of the improvement of the quality of the training of specialists, it is important to enlist in research as many more students as possible. However, they are grouped by the instructions of the USSR and Belorussian SSR Central Statistical Administrations and State Planning Committees with part-time workers and are taken into account when establishing the limits of the size of the staff of

higher educational institutions. It seems that such a procedure should be changed.

The higher school urgently needs the quickest modernization of the material and technical base, for it is impossible either to train students or to conduct scientific research at a high level on equipment and instruments of the day before yesterday. It is necessary that higher educational institutions would receive capital investments for the development of science and would be provided with funds for materials and equipment, and first of all for computer technology and other latest equipment. For the present the Belorussian SSR State Planning Committee and the Belorussian State Committee for Material and Technical Supply are filling less than half of the orders of higher educational institutions, with respect to some items they are filling them even less. Such an attitude had the result that at higher educational institutions at present up to half of the equipment is obsolete and worn out and is liable to being written off. Perhaps, when it is a matter of material and technical supply, it is time to transfer the Belorussian SSR Ministry of Higher and Secondary Specialized Education from among the "others" to the list of priority ministries and departments.

Sectorial ministries and departments can and should give us much assistance in material supply, by organizing sectorial scientific research laboratories with their corresponding supply with all resources. Unfortunately, several republic ministries are reluctantly meeting higher educational institutions half way. Thus, the Belorussian SSR Ministry of Rural Construction and the Belorussian SSR Ministry of Industrial Construction refused to open an intersectorial laboratory for the development and study of superplasticizers of concrete at the Novopolotsk Polytechnical Institute, although as a result of the processing of the waste products of chemical works in this city about 40,000 tons of the superplasticizer could be obtained, which would meet the needs of construction of Belorussia and the Baltic republics.

The accountability for the level, quality, and fulfillment of economic contractual scientific operations at higher educational institutions is increasing, at the same time the responsibility of the client enterprises and the sectorial ministries and departments for the results of these operations has been reduced, since they do not report back on the economic impact from economic contractual research and can arbitrarily halt it and not issue a certificate on introduction and the economic impact. Therefore, in our opinion, standard documents, which regulate the rights, obligations, and responsibility of the developers and clients for the performance of research, the pilot industrial checking, and the introduction of the results, are needed.

It is time for the Belorussian SSR State Planning Committee, in our opinion, to simplify the procedure of the submitting, the making of an interdepartmental appraisal, and the inclusion in the state plans of the economic and social development of the Belorussian SSR and sectorial plans of the proposals of the Belorussian SSR Ministry of Higher and Secondary Specialized Education on the use in the national economy of the results of completed research. The problem of introducing patentable inventions is becoming especially urgent, since not only export, but also the sale of

licenses are impossible without industrial assimilation. The requirement of clear prospects of introduction with respect to inventions, which are recommended for patenting, is an urgent necessity of today.

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REGIONAL ISSUES

RESEARCH, DEVELOPMENT, IMPLEMENTATION PROBLEMS IN KIRGHIZIA

Frunze SOVETSKAYA KIRGIZIYA in Russian 28 Sep 85 p 2

[Article by Doctor of Technical Sciences Zh. Sharshenaliyev, director of the All-Union Scientific Research Institute of the Complex Automation of Reclamation Systems: "Do Not Lose the Prospect"; first paragraph is SOVETSKAYA KIRGIZIYA introduction]

[Text] The need to increase sharply the efficiency and quality of scientific research and design developments and to ensure the production of fundamentally new equipment and technology was emphasized at the conference in the CPSU Central Committee on the acceleration of scientific and technical progress. In the republic there are tens of academic and sectorial scientific research institutes and their affiliates, planning organizations, and design bureaus. A significant scientific potential is concentrated at higher educational institutions. However, the results of the activity of many of these collectives do not satisfy today's requirements. This concerns, in particular, reclamation and water resource developments.

One of the longstanding misfortunes of our sector is the intolerably extended time of the assimilation of innovations. And the main reason for this is the lack of comprehensive planning which would envisage the continuity of the "research--development--introduction" chain. And without this one will not shorten the time from the origin of an idea to its practical implementation. Goal program methods of the planning and development of the automation of the processes of reclamation and water management are needed. But they do not exist either on the scale of the republic or for oblasts.

In other words, the prospects in the development and assimilation of fundamentally new equipment and technology have been lost. Instead of fundamental problems, minor themes, which are far from scientific and technical progress, are frequently included in the plans of scientific research institutes. In many ways this is occurring due to the imperfection of the material stimulation and the poor interest of the officials of ministries and subdivisions, who are directly responsible for the planning and introduction of innovations. It is no secret that production workers are also trying to avoid the troubles which are connected with the changeover of technology.

So far active cooperation with academic and sectorial institutes and higher educational institutions of our type has not been established. I have in mind, in particular, the Institute of Automation of the Kirghiz SSR Academy of Sciences and the agricultural institute. The plans of research work of each of them are not coordinated, at times they duplicate each other. The volume of annual economic contractual themes with the republic Ministry of Land Reclamation and Water Resources is small. As a result in the past year only one advanced process and three inventions were introduced in the sector, and only one type of new product was assimilated.

The fact that the subdivisions of the republic Ministry of Land Reclamation and Water Resources, Ministry of Agriculture, and Ministry of the Fruit and Vegetable Industry in essence are not taking part in the formulation of the plans of research, planning, and surveying work, is also having an effect. And both the very management of them and planning are obsolete. It seems that the question of the establishment of a scientific production association for the automation of reclamation systems is ripe. Life has confirmed that this is the most effective form of the contact of science with practice. The work of the operating staff also needs improvement.

The complexity and scale of the problems being solved also presume an increased competence and scientific and technical level of the managers of the services of ministries, which determine the technical policy in the sector. That is, it is a question of the same psychological reform. It is also important to coordinate the plans of the retooling of enterprises with the plans of their automation. In Khirghizia a large number of operating hydraulic reclamation systems are updated annually, however, the questions of automation are far from always taken into account in the plans of renovation. The matter has acquired the greatest urgency in connection with the transfer to the balance sheet of the Ministry of Land Reclamation and Water Resources of an enormous internal economic irrigation system, a large portion of which is in unsatisfactory condition.

For the present the evaluation of the efficiency of the systems being developed is not very thorough. It seems to us that it is important to find such a method which would take into account both the national economic and the local impact of automation. And in case of the planning of capital investments for these purposes first of all the increase of the technical level and the qualitative improvement of the structure of production should be the criterion of efficiency.

Experience shows that 8-10 years usually pass from the development to the introduction of fundamental innovations. The period is long. It is necessary to seek and to introduce more rapidly such solutions, means, and systems, which would increase labor productivity by several fold.

The improvement of the information, material, and technical supply of subdivisions and the introduction of computer-aided design systems and automated workplaces of specialists would help to increase the efficiency of scientific research and applied development. The main goal of all the steps being taken is the development of fundamentally new approaches and the high-quality interconnection of machines, instruments, and technologies. The

accomplishment of these tasks depends to a significant degree on the supply with modern laboratory equipment, computers, and means of the mechanization of field experiments and on the skills of specialists.

The initiative and persistence of developers themselves play a significant role in the introduction of the results. It is no secret that many of us still consider our mission completed with the completion of the research stage. The novelty of the solutions, we believe, should become another important condition. The analysis of economic contractual themes shows that for the most part they are connected with the modernization and improvement of existing types of equipment and technologies. Here, as a rule, traditional methods are used. But where is modern world know-how?

Our lag in the mechanization and automation of technological processes and the use of minicomputers and microcomputers in engineering and design activity, for example, is alarming. We will say frankly: we do not have any objective reasons to develop imperfect and unreliable equipment which is obviously inferior to foreign analogues. The achievements of the Soviet electronics and instrument making industry serve as the best confirmation of the fact that it is possible to set the tone in the world. Would our successes in space really have been possible without the highest demands on the quality and precision of the items being produced?

Unfortunately, the existing sequence of research and design work does not make strict demands on the making of a preliminary patent search. Although a new all-union state standard, which is aimed at the elimination of such a situation, was put into effect in January 1984, many patent services and scientific associates so far have not reformed their own work. Today the use of fundamental innovations in practice also cannot satisfy. Thus, during the years of the current five-year plan alone associates of the institute have received more than 170 certificates of authorship for inventions. But during the same time only...nine of our inventions were used in the republic Ministry of Land Reclamation and Water Resources in accordance with the plan of the introduction of new equipment. This is hardly normal.

Great hopes are being placed today in young scientists. At the institute we are forming from among enthusiasts multiple-skill creative youth collectives for the solution of specific problems. For example, one of these multiple-skill creative youth collectives was commissioned 2 years ago to develop and introduce non-energy-consuming highly productive technologies and equipment of surface irrigation. The task was successfully accomplished. The labor productivity of the irrigation workers increased by nearly fourfold, while the saving of water came to up to 30 percent. The work of the collective of authors was nominated for the Leninist Komsomol Prize of the country in science and technology for 1985.

As to the more extensive use of innovations, the organization of temporary interdepartmental collectives is seen as one of the means of solving the age-old problem. The establishment of a republic coordinating council, which would direct the efforts of planning, economic, financial, and scientific units (academic, sectorial, and of higher educational institutions) at the

quickest introduction of the results and would help to solve promptly and completely all the problems which have arisen, would contribute to the acceleration of the pace of scientific and technical progress.

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REGIONAL ISSUES

BETTER PLANNING OF SCIENTIFIC, TECHNICAL PROGRESS IN UKRAINE

Moscow PRAVDA in Russian 29 Oct 85 p 2

[Article by Deputy Chairman of the Ukrainian SSR Council of Ministers S. Gurenko (Kiev): "In Accordance With the Comprehensive Programs. Accelerate Scientific and Technical Progress"; first two paragraphs are PRAVDA introduction]

[Text] As was noted in the draft of the new version of the party Program, the cardinal acceleration of scientific and technical progress is a vital issue of the economic strategy of the party. A new technical renovation of the national economy has to be carried out and on this basis the material and technical base of society has to be transformed.

This principle fully determines the means of the development of the economy of the Soviet Ukraine--a component of the unified national economic complex of the country.

More capital investments have been allocated for the renovation of industrial enterprises by the plan of the social and economic development of the Ukrainian SSR for 1985 than was established by the assignments of the five-year plan. As compared with last year the volumes of the introduction of advanced resource-saving technologies have increased by a third.

The conception of scientific and technical progress for the future has been specified. At its basis is the saving of resources in all the spheres of social production. The technical level of production has to be increased significantly, the cardinal saving of living labor has to be ensured, and the more efficient use of raw material, material, energy, and natural resources has to be achieved by the extensive introduction of advanced modern developments and the updating of fixed capital.

An entire set of measures is being implemented in the republic for the accomplishment of this task. Their essence consists in the consolidation of party supervision of scientific and technical progress and the increase of the role and responsibility of ministries and departments and of local small soviet and economic organs.

The goal program method of management, as experience has shown, has become a reliable organizational basis of the concentration of the efforts of collectives of scientists and production workers in the direction of a unified scientific and technical policy. Today in the Ukraine along with 160 union programs 340 programs of the republic and sectorial level are in effect. They are helping to expedite the development of the national economy. Thus, the fulfillment of the assignments of the republic programs has made it possible since the start of the five-year plan to save the labor of about 4 million people. The consumption of metal as compared with 1980 has decreased by more than 1 million tons, cement--by nearly 300,000 tons, more than 8 billion kilowatt-hours of electric power have been saved. During the past five-year plan the material intensiveness of production in the republic increased annually. But in 4 years of the current five-year plan it has decreased by 3.5 percent. This contributed to the increase of the national income by more than 3.5 billion rubles and to the additional increase of the productivity of national labor by 3.6 percent.

The impact was achieved owing to the decrease of the consumption of all types of resources on the basis of the acceleration of scientific and technical progress. The means of improving this work were discussed by the Council for the Promotion of Scientific and Technical Progress attached to the Ukrainian CP Central Committee.

A detailed analysis showed: the goal program approach should yield an even more significant and, I will emphasize, real, and not conditional, economic impact. For example, it is difficult to evaluate the effectiveness of individual programs of the oblast level, since they are not always clearly oriented toward the improvement of the most important indicators of economic development, the planned levels of assignments are not specified everywhere. For the present their contribution to the saving of resources is still negligible. The effectiveness of some sectorial programs is also low.

One of the causes of such a situation is the inadequate coordination of the goals of the programs of the sectorial, regional, and republic levels. The elimination of this shortcoming and the aiming of the programs of all levels at the solution of basic national economic problems should increase substantially the return of the scientific and technical potential of the republic.

Now the main assignments of the most important republic programs are also formulated with a breakdown by sectors and regions. The basis for the determination of the special-purpose assignments of oblast and sectorial scientific and technical programs is thereby created, the "share" of the oblast or sector in the accomplishment of the main tasks is specified. As a result the oblast and sectorial programs are oriented toward the acceleration of the mechanization of manual labor, the increase of quality, and the extensive use of resource-saving technologies and secondary raw material resources. Such an approach should strengthen the cooperation of sectorial and territorial organs of management.

The reserves here are great. The experience of Dnepropetrovsk Oblast, where a search is being made for effective forms of controlling product quality and

the saving of resources, testifies to this. The impact from the introduction of comprehensive systems of quality control and resource saving in the oblast has exceeded since the beginning of the five-year plan 630 million rubles.

Accomplishing in practice the task posed by the party of the quickest progress in the strategically important directions, scientists of the republic are working persistently on the intensification of the integration of science and production.

A promising form of the embodiment of innovative developments in production--engineering centers--emerged not that long ago at the republic Academy of Sciences. It is a question in essence of the attempts to form to start with within academic scientific and technical complexes specialized organizations, the purpose of which is to give scientific and technical innovations a start in life and to ensure their extensive introduction. Working in direct contact with the scientific collective, these centers receive the results of basic research firsthand and unite the efforts of scientists, designers, process engineers, and specialists of the pilot production base on the development and introduction of fundamentally new technologies and instruments.

It seems that this one find of the successful ones of scientists of the Ukrainian SSR Academy of Sciences will make it possible to overcome more successfully the notorious departmental barriers, to "undo" much more rapidly the bottlenecks, and to introduce more vigorously the developments which are of intersectorial importance. In our opinion, the advantages of the engineering centers will be realized most completely precisely under the conditions of a regional set of programs, which makes it possible to encompass all sectors.

Appraising critically what has been achieved, it should be said that not everything has yet been done for the increase of the creative return of scientists, engineers, and specialists of the national economy, so far the required pace of retooling and technological updating and of the increase of labor productivity in the sectors has not been ensured. Thus, considerable efforts have been channeled into the mechanization of the labor of miners, but the plan on new equipment is not being fulfilled in the Ukrainian SSR Ministry of the Coal Industry.

The situation with the sectorial comprehensive program of mechanization is also no better. The still substantial miscalculations in the work of executives of this ministry have not been eliminated, not everything has been done for the efficient use of mining equipment, the production of means of small-scale mechanization is being poorly developed, technological discipline is frequently violated. Moreover, in the past 10 years the miners of the Donbass have not received from enterprises of the Main Administration of Coal Machine Building, which is subordinate to the USSR Ministry of the Coal Industry, reliable equipment for the mechanized mining of fuel in thin seams. But they account for about 60 percent of all the Donbass coal. As a result in the mines the number of workers, who are engaged in difficult manual labor, is not decreasing.

It is important to improve constantly the planning of the development of science and technology. It seems that the number of indicators, which are reported by the departments to industrial enterprises in the plans on new equipment, should be reduced substantially. It is advisable, in my opinion, to establish a plan of the increase of labor productivity and the decrease of the product cost by the introduction of scientific and technical developments. These indicators should be taken into account as the most important ones when evaluating the economic activity of associations and enterprises.

In the Ukrainian SSR such a procedure has been in effect for more than 4 years for all the union-republic and republic ministries and departments. At the same time as this goal programs of resource saving are being implemented. Such an approach is helping to overcome the gap between the production plans and the plans on new equipment and to evaluate more precisely the influence of scientific and technical progress on production.

It is also necessary to improve the statistical reporting on the fulfillment of the plans on new equipment. At present the economic indicators of the introduction of scientific and technical developments become known only after the end of the year. But at times the data on the actual impact of completed scientific research and experimental design operations in case of introduction at the client's prove to be tens of fold less than the forecast data. Apparently, the need has arisen to establish that enterprises should submit a full report on the work on new equipment after the end of the year, but quarterly with respect to the basic economic indicators of the introduction of innovations.

It is important, in our opinion, to increase the responsibility of economic managers and chief accountants for the reliability of the reports on new equipment. The settlement of these issues by the USSR State Planning Committee, the USSR State Committee for Science and Technology, and the USSR Central Statistical Administration will increase the promptness and reliability of the information on the effectiveness of the scientific and technical development of enterprises and sectors.

The innovative tasks on the increase of production efficiency and the acceleration of scientific and technical progress, which are formulated in the draft of the new version of the party Program, are responsible and large-scale. The extension of the goal program approach and the concentration of all scientific and technical forces on the solution of the fundamental problems of the intensification of the economy will be a specific step toward their accomplishment.

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CONFERENCES AND EXPOSITIONS

INTENSIFICATION-90 EXHIBITION IN LENINGRAD

Moscow IZVESTIYA in Russian 11 Sep 85 p 2

[Article by Ye. Simonenko (Leningrad): "Managers Are Learning Here. The Intensification-90 Exhibition-Seminar Is Being Held in Leningrad"]

[Text] If we want to manage intelligently and economically and to accelerate technical progress, we should gather bit by bit the accumulated advanced know-how and immediately use it in our work.

Leningraders gathered all the best that had been developed by their enthusiasts of technical progress at the Intensification-90 Exhibition. Hundreds of enterprises and research and design organizations presented at the exposition industrial robots and flexible production modules, systems of the automation of designing and computer complexes, the latest equipment and instruments for scientific research, and lasers, which are being used in the most different sectors of the national economy.

But in the end it is a matter not even of the ultramodern equipment, which overflowed the hall of the new exhibition hall, but of the clearly displayed examples of how in practice the interests of science and production are being judiciously combined and the efforts of a large number of organizations, which are taking part in the implementation of the Intensification-90 Territorial Sectorial Program, have been united.

Specialists are coming to this unique educational auditorium from all corners of the country. A seminar of party, soviet, and economic managers was organized here. The experience of the Leningrad Party Organization in the intensification of the economy will help them to solve many of their own sectorial and territorial problems.

PHOTO CAPTIONS

1. Left. The seminar participants familiarize themselves with the operation of the robotized line of precision stamping, which was produced by the Leningrad Elektronpribor Production Association.

2. Middle. A machining center intended for the production of parts in accordance with "unmanned technology." It is produced by the Ivanovo Machine Tool Building Production Association imeni 50-letiya SSSR.

3. Right. A multifunctional manipulator based on an excavator, which was produced by the Lenstroyrobot Production Association.

Press photos of IZVESTIYA special correspondent A. Stelmakh.

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AWARDS AND PRIZES

POWER PLANT CONDENSER-COOLER NOMINATED FOR ARMENIAN STATE PRIZE

Yerevan KOMMUNIST in Russian 10 Sep 85 p 4

[Article by candidates of technical sciences L. Oganesyan and V. Marukhyan under the rubric "For the Armenian SSR State Prize": "A Valuable Technology Has Been Developed"]

[Text] In our times the shortage of fresh water is becoming a more and more urgent problem. It concerned 2-3 decades ago only the regions which from time immemorial had been deprived of sources of water. Today the resources of natural water have turned out to be limited in many industrially developed zones.

The geography of the shortage of fresh water is expanding as a result of the rapid development of water-consuming sectors of industry. Among them, first of all, is power engineering, since at powerful heat and nuclear electric power plants natural water is used in large quantities for the condensation of the steam which has been spent in the turbines.

Moreover, in the southern European part of the USSR natural water is highly mineralized. The rapid formation of scale in the heat exchangers occurs in case of its use for the condensation of steam. And this leads to forced downtimes of the power-generating units.

The solution of the problem lies in the changeover to the air condensation of the steam.

This method was implemented for the first time in domestic heat engineering at the four 200-megawatt power-generating units of the Razdanskaya GRES, which are equipped with new condenser-coolers (KOU's). It is possible to regard their ecological qualities as irreproachable.

However, the assimilation of power-generating units with condenser-coolers came up against an extremely serious obstacle which jeopardized the profitability of the method: this is the rapid pitting of the aluminum tubing of the cooling towers upon contact with the condensate being cooled in them.

The point is that in contrast to ordinary power-generating units, at the power-generating units of the Razdanskaya GRES the condenser-cooler is an

integral part of the overall condensate-feeding system. The latter is made of carbon steel and brass. The generally accepted methods of suppressing the corrosion of these two metals in an aqueous medium are in variance with the known methods of the corrosion protection of aluminum. The made measurements showed that given the traditional water-chemical state of the named system, as a result of the strong corrosion of aluminum, the life of the cooling towers comes to no more than 5 years, that is, is intolerably short. Along with this a special anticorrosion chemical coating of the water circulation lines of the condenser-cooler, the cost of which for each power-generating unit came to about 1 million rubles, was also required. In other words, the known methods of corrosion protection did not make it possible to ensure the preservation and operating reliability of all the equipment of power-generating units with condenser-coolers. The development, introduction, and adjustment of the optimum water-chemical state with respect to the prevention of corrosion proved to be a complicated applied scientific problem. Its solution was the result of the bold creative search of specialists of the Razdanskaya GRES and a number of other power engineering organizations. The drawn conclusions were completely confirmed in the process of the subsequent operation of the power-generating units in case of the new water-chemical technology.

The continuous use of this technology for 12 years showed that the corrosion of aluminum cooling towers is practically absent. The need for the labor-consuming and expensive chemical coating of the water circulation pipes disappeared. Given this technology it is not necessary to furnish the power-generating units with condenser-coolers with units for the additional purification of the condensate. Finally, as compared with the traditional conditions, the enrichment of the heat-transfer medium with the products of corrosion also decreased in the remainder of the circuit.

All this decreased sharply the appearance of the products of corrosion in the boilers and accordingly the formation in them of deposits which previously led to frequent downtimes of power-generating units for preventive cleanings. The reliability of power-generating units with condenser-coolers in a maneuverable mode, which is necessary for the national economy, was ensured.

Another urgent problem, which pertains to the prevention of dangerous deposits in the evaporating pipes of hot water heaters, was also solved at the same time. The comprehensive studies of the physical chemical factors of internal boiler corrosion led the authors of the work to the conclusion that lithium hydroxide should be used instead of phosphates. The use of lithium treatment from 1974 to the present at all the power-generating units of the Razdanskaya GRES confirmed the correctness of the choice.

A unit, which increased significantly the economy of lithium treatment and ensured environmental protection, was developed and introduced.

It can be asserted with good reason that the developed technology made a decisive contribution to the assurance of many years of reliable operation of the power-generating units of the Razdanskaya GRES. At the same time the preservation of the aluminum cooling towers created the conditions for the development of irrigated farming in dry Razdanskiy Rayon.

In recent years the authors have additionally developed and introduced a number of new effective methods of the monitoring and control of water-chemical and internal boiler processes. The economic impact of the developed technology is more than 6 million rubles. It is widespread at a number of thermal electric power plants and nuclear electric power plants.

Thus, the work "The Development and Introduction of a New Highly Efficient Technology of the Prevention of Corrosion and the Formation of Deposits in the Power-Generating Units of the Razdanskaya GRES With Aluminum Cooling Towers, Which Ensure the Saving of Water Resources and the Protection of the Ecology," the authors of which are: A.K. Ayvazyan, F.Kh. Akopdzhanian, A.P. Borovskiy, A.A. Kot, G.R. Santuryan, and G.P. Sokolovskaya, was carried out at a high scientific and technical level and is distinguished by novelty and a great national economic efficiency. We believe that it has been deservedly nominated for the 1985 Armenian SSR State Prize in Science and Technology.

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GENERAL

SOCIOECONOMIC DEVELOPMENT, SCIENTIFIC, TECHNICAL PROGRESS LINKED

Moscow EKONOMIKA I MATEMATICHESKIYE METODY in Russian Vol 21, No 5, May 85
pp 771-777

[Article: "In the Direction of the Acceleration of the Socioeconomic Development of the Country on the Basis of Scientific and Technical Progress"]

[Text] The conception of the acceleration of the socioeconomic development of the country on the basis of scientific and technical progress was formulated in the decisions of the April (1985) CPSU Central Committee Plenum. In the speeches of General Secretary of the CPSU Central Committee Comrade M.S. Gorbachev at the plenum, during the meeting in the CPSU Central Committee with managers of industrial associations and enterprises, kolkhozes and sovkhozes, and production brigades, specialists and scientists, and at the conference on questions of the acceleration of scientific and technical progress, and in other speeches of his the continuity of the strategic policy, which was formulated by the 26th party congress and the subsequent central committee plenums, was categorically confirmed. In Lenin's understanding continuity signifies continuous movement forward, the identification and solution of new problems, and the elimination of everything that hinders development.

The country has achieved great gains in all areas of social life. Relying on the advantages of the new system, it accomplished in a short historical time the ascent to the heights of economic and social progress. The Soviet Union now has a powerful, thoroughly developed economy and skilled staffs of workers, specialists, and scientists. In many directions of the development of production, science, and technology we securely hold the leading positions in the world. Profound changes have occurred in social life.

The Soviet people are by right proud of all this. But life and its dynamism dictate the necessity of further changes and transformations, the achievement of a new qualitative state of society, moreover, in the broadest sense of the word. This is first of all the scientific and technical updating of production and the achievement of the highest world level of labor productivity. This is the improvement of social relations, and first of all economic relations. This is profound changes in the sphere of labor and the material and spiritual conditions of the life of people. This is the activation of the entire system of political and social institutions and the extension of socialist democracy and the self-government of the people.

The development of Soviet society will be determined to a decisive extent by qualitative changes in the economy, its changeover to the path of intensive growth, and the utmost increase of efficiency. The situation in the national economy should be evaluated and the tasks for the future should be posed precisely from this standpoint.

It is well known that along with the achieved gains in the economic development of the country in recent years the adverse trends have intensified and many difficulties have arisen. Owing to the active work of the party, starting in 1983, it was possible to take in hand the work of many units of the national economy and to improve the situation somewhat. However, the difficulties have far from been overcome, and we have to exert considerable efforts in order to create a reliable basis for rapid progress.

The questions of the causes of the difficulties are today of fundamental importance. In answering them, General Secretary of the CPSU Central Committee M.S. Gorbachev noted that the influence of natural and a number of external factors, of course, had an effect. But the main thing is that the changes in the objective conditions of the development of production and the need for the acceleration of its intensification and changes in the methods of management were not properly evaluated in good time and, what is especially important, persistence was not displayed in the formulation and implementation of major measures in the economic sphere. It is necessary to become thoroughly and completely aware of the formed situation and to draw the most serious conclusions. The historical fate of the country and the position of socialism in the modern world depend in many ways on how we will pursue the matter further. By using extensively the achievements of the scientific and technical revolution and bringing the forms of socialist management in line with the present conditions and needs, we should achieve a substantial acceleration of socioeconomic progress. There is simply no other means. Today the success of the cause of socialism and communism is governed by this.

The main question now is how and by means of what the country will be able to achieve the acceleration of economic development. Real possibilities exist for this. The task of the acceleration of the growth rate, moreover, the substantial acceleration, is quite practicable, if the intensification of the economy and the acceleration of scientific and technical progress are placed at the center of all our work, management and planning and the structural and investment policy are reformed, organization and discipline are increased everywhere, and the style of activity is radically improved.

It is possible to obtain a comparatively rapid return, if the organizational, economic, and social reserves are put to use and, first of all, the human factor is activated and it is seen to that each person at his place would work conscientiously and to full effect. Cost accounting enterprises and associations work most effectively only when each worker has an effective influence on the management of his collective as a whole. The development of democratic centralism in the mature socialist economy and the active, creative participation of workers in management are thereby determined. It includes extensive publicity, information, and the participation of collectives and each worker in the discussion and solution through party, trade, and other public unions and organizations of the social and economic problems of the

life of the collective in conformity with the existing legislation. This factor is predetermining to a greater and greater extent the course of the socioeconomic development of society. The worker-co-owner of the means of production, who is becoming "not only the manager at his own plant, but a representative of the country" (V.I. Lenin, "Poln. sobr. soch." [Complete Works], Vol 36, p 369), is being brought to the center of attention. This is a truly socialist reserve of efficient management, which no other social system has and can have.

The possibilities here are so great, the meeting with workers, economic managers, specialists, and scientists in the CPSU Central Committee showed. When the need arises, the participants in this conference noted, only by means of the fact that the collectives and their managers somehow take themselves in hand and begin to work better, is it possible in a short time to increase labor productivity by such amounts which, at times, are comparable to the plan assignments for the entire five-year plan. Consequently, much depends on the attitude of labor collectives toward the matter, on activeness, and on the ability to interest people in the maximum use of all the possibilities of the growth of production and the increase of its efficiency.

An important aspect of the question of responsibility and discipline is the timely and high-quality supply of raw materials, fuel, and components, the supply of railroad cars, and so on. A definite change in the tightening up of contractual discipline in the national economy has been noted. It is necessary to strengthen it, by steadily increasing the demandingness for the fulfillment of contractual obligations without any allowances for objective conditions. Another reserve is the combating of waste and losses. The executives of many ministries and enterprises are striving to "pound" out of the state some more capital investments, machine tools and machines, raw materials and fuel. At the same time they frequently treat irresponsibly their efficient use. The available equipment at times is idle or is not used at full capacity. In capital construction considerable physical assets are being frozen due to its inordinate duration. The increase of capacities is being delayed, the country is not receiving the necessary products on time.

The plan on the placement of fixed production capital into operation is being fulfilled unsatisfactorily. The direct losses of physical assets due to negligence in the transportation, storage, and consumption of cement, coal, mineral fertilizers and lumber, agricultural products, and food stuffs are significant. It is necessary to put an end to such waste immediately and to increase the accountability of specific people, including legislative accountability, for the preservation and proper use of all physical assets.

The party is bringing the cardinal acceleration of scientific and technical progress to the forefront as the main strategic lever of the intensification of the national economy and the better use of the gained potential. The front line of the struggle, General Secretary of the CPSU Central Committee Comrade M.S. Gorbachev emphasized at the conference on questions of the acceleration of scientific and technical progress, passes here through science. The achievements of Soviet scientists in various spheres of knowledge and technical progress are universally recognized. It is possible to be proud of the achievements in the studies of space, mathematics and mechanics,

thermonuclear fusion, and quantum electronics, and in a number of fields of biology. Promising developments exist in nearly every scientific and technical direction.

At the same time one should look at the tasks of science through the prism of the requirements of the times--the requirements of its resolute turn toward the needs of social production, and of production toward science. From this standpoint all the links of the chain, which unite science, technology, and production, should be analyzed and strengthened.

It is necessary to attach priority importance to the development of basic science. Precisely it acts as the generator of ideas, makes breakthroughs into new fields, and provides outlets to a new level of efficiency. The role of the USSR Academy of Sciences has to be increased. It is necessary to turn academic institutes sharply in the direction of the broadening of research which has a technical orientation and to increase their role and responsibility for the development of the theoretical principles of fundamentally new types of equipment and technology. Science of higher educational institutions, the possibilities of which for the present are not being used completely, is an important reserve. Meanwhile, according to the available estimates, higher educational institutions can increase the amount of scientific research work by 2- to 2.5-fold.

Great complaints should be lodged against and great demands should be made on sectorial science. Hundreds of scientific research institutions and planning, technological, and design organizations are subordinate to industrial ministries. Meanwhile in the majority of sectors scientific and technical progress is proceeding sluggishly, in reality, in an evolutionary way--primarily by the improvement of operating technologies and the partial modernization of machines and equipment. Of course, these measures are yielding a definite return, but it is too small. Revolutionary changes are needed--the changeover to fundamentally new technological systems, to equipment of the latest generations, which yield the greatest efficiency. It is a question in essence of the retooling of all the sectors of the national economy on the basis of the modern achievements of science and technology.

The urgency of the problem is also dictated by the fact that during the recent period the production system of the country has aged greatly, the coefficient of the replacement of fixed capital has decreased. During the 12th Five-Year Plan the substantial increase of the coefficient of the replacement of equipment should become top priority. It is necessary to give its development a priority nature and already during the 12th Five-Year Plan to speed up the growth rate of the sector by 1.5- to 2-fold.

In light of these tasks it is necessary to increase the role and authority of foremen, engineers, designers, and process engineers and to increase the material and moral stimuli of their labor.

The acceleration of scientific and technical progress and the growth of production efficiency is inseparable from the determined improvement of product quality. The lack of its conformity to the present technical, economic, aesthetic requirements--all consumer requirements--and at times an

obvious flaw are, in reality, the misappropriation of material resources and the waste of the labor of our people. That is why the utmost increase of product quality should be at the center of economic policy. Having solved the problem of quality, it is also possible to solve the problem of quantity. This is the only reliable means of the more and more complete meeting of the needs of the country for modern equipment and the growing demand of the population for various goods and the overcoming of shortages in the national economy.

No matter what question we examine, from no matter what angle we approach the economy, in the end everything comes up against the need for the serious improvement of management and the economic mechanism as a whole. There is one way out of the situation: immediate and vigorous steps on the entire set of problems of management are needed.

The conception of the reform of the economic mechanism has now become clearer. In developing further the centralized principle in the solution of strategic problems, it is necessary to advance more boldly in the direction of the broadening of the rights of enterprises and their independence, to introduce cost accounting, and on this basis to increase the responsibility and the interest of labor collectives in the end results of work. It is necessary to make the economy as receptive as possible to scientific and technical progress and to ensure the vital interest in this of all the units of the national economy.

In the changeover of the economy to the path of intensive growth the systematic aiming of all the units of production and management at the achievement of national economic results--the effective meeting of the increasing social needs--is the main direction. This means, first, the concentration of the highest levels of management on the determination of the plan goals and the means of the development of economic and social processes, on the coordination of strategic and current tasks, as well as on the improvement of the norms and rules of the interaction between economic units of society. Second, the truly cost accounting nature of the work of enterprises and associations, in case of which the collectives of workers assume the responsibility to society and their own workers for the end results of management, and not only for the fulfillment of numerous, frequently intermediate general indicators. Finally, third, the assignment to the consumer (both production and nonproduction) of the role of the basic representative of the interests of society and the assurance of the effective economic and legal protection of his interests.

Given the changeover to intensive management the basic components of state economic policy are developed as a unified system which aims sectors, regions, enterprises, and associations at the end results:

--scientific and technical policy--at the assurance of a high rate of the updating of the technical and technological potential with new and the latest equipment and machines according to world standards. The CPSU Central Committee has noted the importance of the initiative of Leningraders on the formulation of a program of intensification on the basis of the acceleration

of the introduction of scientific and technical achievements at enterprises of the region;

--structural policy--at the leading and rapid development of works and regions, which are satisfying priority social needs. The USSR Food and Energy Programs and the fast pace of the development of a number of territorial production complexes (the Western Siberian Petroleum- and Gas-Bearing Complex, the Kansk-Achinsk Complex, and others) are aimed at this. The dynamicness of the proportions is being achieved, along with the establishment of new and the latest sectors, by planned renovation and the change of the production specialization of operating enterprises, which "are holding on through tradition, routine, and the reluctance of the workers to change occupation" (V.I. Lenin, "Poln. sobr. soch.," Vol 43, p 263);

--financial policy--at the precise and reliable balancing of the material and monetary resources of the national economy, which eliminates shortages and surpluses of them in the national economic turnover, which requires first of all unified material and financial planning, as well as the extension of credit to enterprises by banks strictly to the extent of the real needs for monetary assets. "Remember that any radical reforms of ours are doomed to fail, if we do not have success in financial policy" (V.I. Lenin, "Poln. sobr. soch.," Vol 36, p 351);

--management policy--at the gradual development of the mechanism of the economic management of the directions and rates, which ensure the more and more efficient supervision of the production and use of products and services in the national economy.

Greater demands are being made on planning, which is the heart of management. It should become an active lever of the intensification of production and the implementation of progressive economic decisions and should ensure the balanced and dynamic growth of the economy. At the same time it is necessary to relieve the plans of associations and enterprises of the abundance of indicators and to use more extensively the system of general-purpose long-term economic standards, which afford free range to initiative and enterprise.

It is time to begin the improvement of the organizational structure of management, to eliminate the unnecessary units, to simplify the system, and to increase its efficiency. It is necessary to drastically limit the number of instructions, statutes, and methods, which at times, by interpreting willfully the decisions of the party and government, paralyze the independence of enterprises.

The reporting of the principles of cost accounting to all the primary labor units and to each workplace is of great importance. This will make it possible to link the measures on the improvement of the system of management from above with the development of the collective forms of the organization and stimulation of labor from below and to increase the activeness of the workers. For the purpose of intensifying production one should increase the responsibility of each organ of management for that section of management, which has been entrusted to it by the state: planning organs are responsible for the soundness of plan assignments, statistical organs--for the reliability

and promptness of the information being supplied, pricing organs--for scientifically sound levels of prices, and so forth.

It is no less important to increase the responsibility of republic and local organs in the management of economic and sociocultural development and the meeting of the demands of the workers. But for this, of course, it is necessary to broaden further the rights of local organs and to increase their initiative and interest in the development of production, the use of resources, and the organization of all spheres of the service of the population. At the local level they should be completely responsible for the settlement of all issues that belong to their competence and rid themselves more rapidly of dependent frames of mind.

The CPSU sees the greatest point of the acceleration of the socioeconomic development of the country in increasing steadily, step by step the well-being of the people, in improving all aspects of the life of the Soviet people, and in creating favorable conditions for the harmonious development of the individual. Here it is necessary to pursue consistently the policy of the strengthening of social justice in the distribution of material and spiritual goods, the strengthening of the influence of social factors on the development of the economy, and the increase of its efficiency.

This policy is meeting with the complete approval and support of the Soviet people. Now the thing is to elaborate specific, effective steps on ridding the distribution mechanism of leveling, unearned income, and everything that is at variance with the economic norms and moral ideals of our society and to ensure the direct dependence of the material status of every worker and every collective on the results of their work.

The careful formulation of a social program, with which the party will come to its 27th congress, is presently under way. But there are urgent tasks which require particular attention. This concerns first of all the implementation of the Food Program. The work on its fulfillment should be intensified and it should be supplemented by serious steps on the development of the processing sectors of the agroindustrial complex and the bringing of their enterprises closer to kolkhozes and sovkhozes. Such assignments have been given to the USSR State Planning Committee and the corresponding ministries.

The management of the agroindustrial complex also requires further improvement. It is necessary to implement measures which will make it possible to manage, plan, and finance the agroindustrial complex as a unified whole at all levels.

Much also has to be done for the more complete meeting of the demand for industrial goods and services, the market has to be saturated with the necessary products, the quality of the goods being produced has to be improved and their assortment has to be enlarged, greater flexibility has to be given to the system of prices, and the standards of trade have to be increased. The comprehensive program of the development of the production of consumer goods and the service sphere is subordinate to the solution of these problems. It envisages the substantial increase of the production of high-quality clothing and shoes and modern goods for cultural and personal purposes and household

use and the development of diverse types of services. Decrees of the CPSU Central Committee and the USSR Council of Ministers have already been adopted in a number of its directions.

Such spheres as health care and public education are acquiring greater and greater importance in the life of society and each person. We have achieved much in their development and have ensured the equal access of all citizens to these vitally important goods. The material and technical base of health care, the quality of medical service, and the supply of the population with medicines need substantial improvement from the standpoint of present requirements.

The school reform, the importance of which for the future of the country it is difficult to overestimate, has begun. It is necessary to approach not formally, but meaningfully the posed tasks and to improve cardinally the quality of the instruction and training of the rising generations and their preparation for socially useful labor. Among the other questions is the improvement of the material status of veterans of labor, and especially those who left long ago for deserved rest, the living conditions of young families, the protection of mothers and children, and the housing problem.

It is possible to solve the difficult and large-scale problems of the present stage, which affect all aspects of our life, only by relying on the lively creativity of the people, on their wisdom, talent, and labor. It is necessary to inspire millions of workers to their fulfillment, to develop constantly the initiative and energy of the working class, the peasantry, and the intelligentsia, to put to use the inexhaustible potentials which socialist society has, and to support more actively all useful initiatives. That is why it is so important that the results of what has been done would be summarized in a Leninist way, without false idealization and empty logomachies, positive experience would be gathered bit by bit, shortcomings would be revealed fearlessly, the possibilities and specific means of the growth of production, the increase of the efficiency of the economy, and the improvement of the matter would be identified.

The question of tightening up order and discipline is especially urgent today. This is an urgent requirement of the day, which the Soviet people understand broadly, including here order on the job and in the sphere of services, in public life and in daily life, in each labor unit, in each city, in each settlement. In order to tighten up discipline and order, it is necessary that every person would do his own job and perform conscientiously his own immediate duties. It is impossible to achieve substantial results in any sphere of activity until the party worker replaces the economic manager, the engineer replaces the messenger, the scientist works at a vegetable base, the weaver works at a farm. Such a situation did not form immediately, but it is necessary to correct it. Only then will we be able to properly rid ourselves of mismanagement and lack of discipline.

In the area of foreign economic policy the utmost improvement and enrichment of cooperation, the development of the all-round relations with the fraternal socialist countries, the assurance of their close cooperation, and concern about the fundamental combination of the national and international interests

of all the members of the great community are becoming a more and more important task. The Soviet Union supports fruitful and comprehensive economic, scientific, and technical cooperation, which is based on the principles of reciprocity and precludes any discrimination, with developing and capitalist countries.

General Secretary of the CPSU Central Committee Comrade M.S. Gorbachev at the meeting of the aktiv of the Leningrad Party Organization on 17 May 1985 named as the main core of the policy of the party at the present stage "the need for the acceleration of our movement, the need for more sensible, more responsible, more disciplined work. More order, scientific research, and major, important decisions will be required. The enormous mobilization of all creative forces will be required, it will be necessary to do business in a new way." These tasks fully apply to Soviet economics scholars. It is our duty, having reformed our work in conformity with the requirements of the times, to prepare and submit on the threshold of the 27th congress our own recommendations which are aimed at the successful implementation of the policy outlined by the party.

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